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ADVANCED MANAGEMENT

Quarterly Journal

The Society for the Advancement of Management

Functional Authority at the Top
Union Participation and Productivity
New Management Views
The Outlook for Private Enterprise
Leadership and Morale
Time Study Department Standards
Better Utilization of Materials
Industrial Ophthalmology

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ADVANCED MANAGEMENT

Quarterly Journal

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CONTENTS

Comment 49

New Objectives 50

The Anomaly of Functional Authority at the Top—*Henry H. Farquhar* 51

Union Participation: Key to Greater Productivity—*Clinton S. Golden* and *Harold J. Ruttenberg* 55

New Management Views in Today's Hysteria—*O. G. Van Campen* 61

The Outlook for Private Enterprise in America—*Sumner H. Slichter* 67

Mending Our Weakest Links—*McGregor Smith* 77

Standards for the Time Study Department—*Edward deLuca* 84

The Where's and How's of Better Utilization of Materials, Equipment and Labor—*Preben Jessen* 86

The Field of Industrial Ophthalmology—*Albert C. Snell, Arthur Culler* and *Hedwig S. Kuhn* 91

Reviews 95

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Comment

THE "New Objectives" reprinted in this issue from a report of the National Resources Planning Board is an interesting and provocative statement. That it has a bearing upon the thinking of us all as to what, in the affirmative sense, America is fighting for as that relates to local issues, is the reason for its inclusion in these columns.

The war naturally means different things to different persons. But it seems reasonable to suggest that one aspect of the world disturbance has to do with a revulsion of feeling against the national separatisms of the last few decades and with the sense of popular frustration that was felt on the continent of Europe because any basis for peaceful living after World War Number One seemed impossible to attain. The rise of Nazism was in an exaggerated and overcompensatory form, a declaration (among other things) of "the end of economic man." The sense of futility, of being gripped by forces beyond human control, facilitated a swing to the opposite pole of personal and national usurpations of power by a Hitler; and out of despair and passivity came what has come to be called the "dynamism" of that dictatorship. After a generation of materialistic determinism in popular philosophy, came a rightabout face to a summons to Race, to Nation, to Blood and Soil, which supplied a unifying and affirmative dynamic to the German people.

The excesses of their dynamism, the costs in human freedom at which it has been bought, the narrowness of its application to one "Aryan" group, the passion of its exclusion of all differing ideas and beliefs—these are to us staggering and, indeed, barbaric aspects of their total effort.

But it has supplied a unifying force, a galvanizing influence, an emotionally supercharged appeal to the discouraged common folk of Germany. And it is this quality in the appeal which has given this dynamism its terrific, if transitory, momentum.

What we in a democracy have to see—if this analysis has any accuracy—is that democracy itself has to have *its own dynamism*—its own compelling appeal to its own citizenry to unite and work unitedly not merely to win the war but to realize in the peace—both at home and abroad—a way of life which calls out the sustained devotion of common men. Our form of government and the quality of our day-to-day living have to be not just labeled and acknowledged as "democratic." They have to be deeply felt by us all as contributing to the growth and fulfillment of all our citizens—as *satisfying* to our best aspirations—if democracy is to have and to be a sufficient dynamic to arouse and hold popular loyalty. In short, we fight, in part at least, to purify, deepen, extend and realize the best in our own democratic faith and hope. We fight to make democratic ways of living together more truly the fact.

And this is why an examination of "New Objectives" becomes important. If the quality of American life,—for manual worker, for tenant farmer and sharecropper, as well as for those in the upper income brackets—is to seem worth struggling for, we surely have to have some wider agreement upon the aims and purposes of our civilization. It is with that problem that "New Objectives" is concerned. It is to call attention to new and relatively unexplored areas of applying our faith, that this statement addresses itself.

It bears, in other words, upon a clarifying of our war and peace aims. It supplies a guide to crystallizing definite sentiments about concerns we all must have for our unresolved national problems. To executives, and especially to executives disposed to think planfully about their problems, it suggests the relations of executive responsibility to democratic public welfare. It offers hints as to how and where in the conduct of our administrative responsibilities we can begin to think about the kind of victory we want. For that this victory begins or ends on the battlefields of World War Number Two, surely no one can any longer suppose. It relates also to and affects in specific ways the whole idea of the administrative process and of the managerial prerogative. The "managerial revolution" seen in this perspective is the precise opposite in kind from the one projected in Professor Burnham's much discussed book.

To clarify our view of where management and managers should stand in the manner in which they exercise their large and important responsibilities in the next quarter-century, is a challenging demand upon us all.

It is with deep regret that we announce the resignation from the service of the Society of Miss Evelyn Buckley, Executive Secretary. Not the least of her contributions were in her capacity as managing editor, where her indefatigable labors assisted the editors of this Journal in all the details of preparing each issue for the press. Her devotion, loyalty and intelligent service to the Society were of the highest order and she will be greatly missed by all who had come to rely upon her willing co-operation.

ORDWAY TEAD.

NEW OBJECTIVES[1]

WE LOOK FORWARD to securing, through planning and co-operative action, a greater freedom for the American people. Great changes have come in our century with the industrial revolution, the rapid settlement of the continent, the development of technology, the acceleration of transportation and communication, the growth of modern capitalism, and the rise of the national state with its economic programs. Too few corresponding adjustments have been made in our provisions for human freedom. In spite of all these changes, that great manifesto, the Bill of Rights, has stood unshaken a hundred and fifty years. And now to the old freedoms we must add new freedoms and restate our objectives in modern terms.

Freedom of speech and expression, Freedom to worship, Freedom from want, and Freedom from fear:

These are the universals of human life.

Any new declaration of personal rights, any translation of freedom into modern terms applicable to the people of the United States here and now must include:

1. **The right to work, usefully and creatively through the productive years;**
2. **The right to fair pay, adequate to command the necessities and amenities of life in exchange for work, ideas, thrift, and other socially valuable service;**
3. **The right to adequate food, clothing, shelter, and medical care;**
4. **The right to security, with freedom from fear of old age, want, dependency, sickness, unemployment, and accident;**
5. **The right to live in a system of free enterprise, free from compulsory labor, irresponsible private power, arbitrary public authority, and unregulated monopolies;**
6. **The right to come and go, to speak or to be silent, free from the spyings of secret political police;**
7. **The right to equality before the law, with equal access to justice in fact;**
8. **The right to education, for work, for citizenship, and for personal growth and happiness; and**
9. **The right to rest, recreation, and adventure; the opportunity to enjoy life and take part in an advancing civilization.**

These rights and opportunities we in the United States want for ourselves and for our children now and when this war is over. They go beyond the political forms and freedoms for which our ancestors fought and which they handed on to us, because we live in a new world in which the central problems arise from new pressures of power, production, and population, which our forefathers did not face.

Their problem was freedom and the production of wealth, the building of this continent with its farms, industries, transportation and power; ours is *freedom and the distribution of abundance,* so that there may be no unemployment while there are adequate resources and men ready to work and in need of food, clothing and shelter. It is to meet this new turn of events, that the new declaration of rights is demanded. But in formulating these new rights, we are not blind to the obligations which go with every right, obligations of the individual to use well his rights and to insist on the same rights for others, and obligations of the community to support and protect the institutions which make these rights actual. We believe that the American people are ready to assume these obligations and to take the private and the public action they impose.

[1] From "National Resources Development," report of the National Resources Planning Board transmitted to the Congress by the President on January 14, 1942.

The Anomaly of Functional Authority at the Top

By HENRY H. FARQUHAR
Alexandria, Virginia

The vesting of authority in specialists along functional lines was a splendid organization technique—until it was carried too far. The advent of such specialized supervision was a real contribution—so long as it was confined to lower levels in the organization. But we are now learning through bitter experience that divided authority at the *top* breeds distrust, lowers morale, leaves questions unanswered and hinders the vital processes of policy formulation and vigorous execution. The introduction of functional authority at the top has been, in effect, a perversion of sound management principles in a way which the man most responsible for these principles undoubtedly would have been the first to condemn.

FUNCTIONAL or divided foremanship, wherein a shop superintendent delegates authority over his own technical processing details to subordinate "functional foremen" has been found through years of testing in actual application under certain conditions to be an effective tool of management. Frederick W. Taylor first instituted this sort of organization when he began experiments which led to his philosophy of scientific management. His plan substitutes several functional foremen, individually skilled in their respective supervisory duties, for the traditional "gang boss" immediately over the workmen. Each such specialist gives orders to each workman respecting particular details of the processing work.

For example, one functional foreman supervises the assembling of materials, another supervises the actual manufacturing job, another inspects the partially finished product, and so on until the article is complete—a way of getting quick and expert attention to narrowly defined processing details at the point of action.

These functional foremen are responsible to the shop superintendent (or equivalent official) *only,* and are responsible for the actual *processing* phases of manufacturing *only.* Overlapping of authority between the various functional supervisors may thus be kept to a minimum.

Numerous attempts have been and are being made to apply this principle of divided supervision at the upper levels of command. This was perhaps a natural tendency. The chief executive of any big group has of necessity shouldered an increasing burden with the growth of modern complicated economic conditions. It became necessary long ago to remove part of his load by splitting up the total work for which the concern primarily exists into broad operating or action or "dirt shoveling" functions, with a manager in charge of each—functions such as the actual mining of ore and the direct processes in the manufacture and sale of a product. Such a process has sometimes been referred to as the "functionalization" of the work.

Specialists Are Necessary, But "They Should Be On Tap—Not On Top"

Then it was recognized that merely subdividing the work of the administrator along these main operating lines did not fully meet modern demands. It became out of the question to expect the production manager, for example, to be expert not only in processing techniques, but also in the intricacies of all of the other factors which affect the proficiency with which processing itself is carried on—the intricacies of purchasing engineering, research, personnel management, finance, public relations, organization, and so on. It became necessary to supplement the production manager with specialists in these various subjects. No modern business would long survive without such specialized services—constructive services which the operating official does not have time adequately to perform even though he could possess the varied talents necessary.

In casting about for ways in which to utilize such specialists for the good of producing operations as a whole, the administrator resorted to one or the other of two principal methods by which to re-shape his organization structure. One of these ways was based on military, the other on industrial experience.

The military, recognizing the utmost necessity in getting things done of preserving the principle of unity of command in the combat (operating) branches, set up these specialists in two groups. One group is the general *staff advisers* (advisers on personnel, intelligence, training, supply, planning). The other group is the *service* units (finance, chemical warfare, medical care,

manufacture, and various others). These groups *advise* and *serve* the "line" or combat branches, but neither has any authority to issue orders to the line—at any one level in the organization there is but one man who issues orders to those below. Authority is thus concentrated, and therefore individual responsibility or accountability is determinable.

Other administrators turned, perhaps not unreasonably, to the principles which Taylor had found profitable in helping the machinist to use the scientific data which had been collected; in other words, they set up various specialists with *authority* to issue orders to all line or operating men.

The chief executive, then, who has attempted to apply at the upper levels of command the principle of divided supervision which has proved sound at the bottom level, has taken action which is also confusingly described as the "functionalization" of the organization. He has set up—not as an adviser to him and his operating officials, but in the scalar chain reporting direct to him—say a finance manager with delegated *authority* over the production men, covering designated financial and related matters, instructions (orders) regarding which he gives to all who touch upon financial considerations. Similarly, he has set up, perhaps, a personnel manager with authority over designated personnel matters throughout, and a planning manager with similar authority to enforce his plans and methods on all operating personnel. Usually each such "functional" manager reports direct to the chief executive, and so also does each of his operating officials—they are all usually abreast in this respect, although in practical results it would make no difference if the functional managers were at a level above the operating managers.

The usual arrangement (as opposed to such "functionalization" as above) in a big concern with central headquarters and branches scattered over the country, is to have a local district manager reporting direct to the chief executive who has complete authority over all branch activities of every kind (of course within the general policies laid down for the concern as a whole). Each district manager receives orders from the president only, and is solely responsible, under the president, for the results of his operations.

Under the theory of functional authority at the top, however, several men in the headquarters office would issue orders direct to the district—possibly a vice president of production as to technical processing details only, a vice president in charge of personnel management as to labor policies and practices, a controller as to budgets, and an organization and procedures man as to these features of operation. The district manager thus receives orders from several functional managers, just as the machinist receives orders from several functional foremen.

Indeed, the ultimate in this sort of organization is where the headquarters manager—say the personnel vice president—issues orders not to the district manager (courteously so called in this case) at all, but direct to a personnel manager in the district who in turn issues orders to operating men.

This attempt to apply at the top level of command the principles of divided foremanship originally applied at the bottom level is little less revolutionary than was Taylor's break with tradition. The division of authority between such functional managers at or near the top, however, brings out several features in sharp contrast to a similar division at the bottom. Each manager at the top exercises authority over some phase of operations (finance, personnel, methods, and so on) *each* of which affects *all* foremen, all superintendents, all production managers. They interpose a series of authorities between the production officials and their production subordinates; the production manager's authority over his line assistants is siphoned off to these functional specialists who themselves are not directly engaged in or responsible for effective production. Functional managers remove from the production manager, superintendent, and foremen power to control some of the important factors which affect the daily conduct of those officials' work. Each of these production men must look to several other men above them for instructions regarding phases of management of men and materials involved in getting the work done, although these other men have no responsibility which can be clearly traced to them—they exercise authority, but have no determinable responsibility for the results of so doing.

Functional Authority at the Top Makes It Impossible to Fix Individual Responsibility

What happens? Here is what actually happened in one of many similar instances. I set out to find why a group of workmen had failed to meet the delivery date on an important job. That looks simple to the uninitiated, and it should be a simple matter to find out whether the purchasing agent failed to provide the right materials at the right time, whether the toolroom man did not supply proper tools and equipment, whether the

engineer fell down on his specifications or drawings, or just who slipped up in what concrete respect.

Going first to the sub-foreman immediately over the workmen, I learned that all he knew was that a few days before delivery was due he had been told to transfer his men to another job.

When his foreman was asked why men had been pulled from this job, he said he had not been consulted but he understood that specifications on one of the parts had been changed by the engineer for some reason, which made it necessary to send the part to another firm for processing.

Then to the production superintendent, who confirmed what his foreman had said. He added that he had protested the change in specifications to no avail, and that since the engineer as a functional manager had authority to make such specification changes, he, the superintendent, had no alternative but to farm out the work if it was to be done (on special equipment which we did not possess) within the allowed cost as specified by the sales manager.

Thence to the vice president in charge of production. Here the trail began to branch. He said that the sales manager had been forced to lower his original price or have the order canceled, and this resulted in a change in the planned method of processing by our own machinery. He said he had a long discussion with the methods man and the sales manager, but had been unable to persuade them that certain suggested modifications in the specifications would enable us to complete the work at a reasonable cost in our own plant and, he thought, be equally satisfactory to the customer. He advised that I see these two men, since he had no authority respecting either methods or sales.

The next visit was to the methods manager. He granted that the modifications suggested by the production vice president would probably have been satisfactory, but since they had not been thoroughly tested he could not feel safe in approving the changes. He said he thought that the man really responsible for the whole situation was the sales manager, but that in any event he himself, as the director of methods, had no authority regarding costs, new equipment, or sales prices.

So, down the hall to the vice president in charge of sales. He at once said that he had full authority to make and submit estimates to prospective customers, and though he did not make a practice of doing so, in this particular case he "simply had to reduce the price originally agreed upon or lose a valuable customer." He made it very plain, furthermore, that if a change in price made it necessary to change methods to avoid a loss on the order, and if it was necessary to send the work outside, this was all too bad but such matters were outside of his authority and responsibility. He volunteered that it was ridiculous that our shops weren't tooled up to perform all "necessary" processes. He thought perhaps I had better see the real culprit: the treasurer who had final say, under the president, as to the purchase of new equipment in excess of nominal amounts as per the approved budget.

So there we were. I finally gave up the chase, convinced that the only fellow I could put my finger on as being at fault in this case was the customer who had insisted on a lowered price.

With such diffusion of authority one is constantly playing hide and seek with individual responsibility. The "functional" manager in charge of finance is perhaps an aggressive and hardboiled individual whose aim it is to make the best possible financial showing—he brings pressure on the superintendent to this end. The personnel manager is only secondarily interested in costs, but has advanced ideas on how to maintain high morale—he accordingly urges the superintendent to rearrange processes or modify working conditions. The methods man institutes refinements which increase costs, perhaps justifiably, perhaps not; and so it goes. Each such specialist urges his specialty, and has authority if necessary to enforce his desires on men of equal or perhaps greater caliber than himself, often at the expense of or inconsistent with action pressed for by brother specialists; the superintendent is hauled this way and that; pressure and indecision become intolerable. He frequently must become his own judge as to relative priority to be given various programs, and to decide relative values as between the urgings of these various high pressure managers, each of whom is issuing instructions to the superintendent regarding matters which vitally affect operations for which the superintendent is ostensibly held responsible.

Equally serious is the brake on vigorous action which results from multiple bosses at the top. When a problem arises which touches on personnel, finance, methods, procedures, organization (and most problems touch two or more of these simultaneously) the man below who wants to go ahead must consult, not one, but several superiors; he must endlessly confer, explain, argue, get approval or "clearance" from this, that, and the other man—any one of whom can stop him or slow him up. Hesitation and vacillation take the place of aggressive execution—for which no one is to blame!

Functional authority at the top gives power to higher "functional" managers to regulate practices and details of operating officials; the operating official, however, and not the functional manager, is nominally held responsible for operating results.

It cuts across and mixes up clear-cut line authority. It seriously lessens or wholly destroys the possibility of definitely holding a specific official at each point *individually accountable* for results with corresponding rewards or penalties—a cardinal objective in any organization setup.[1]

What has been described is not fiction; it is a distressingly frequent situation in business and in government today although in industry the peak of this sort of "functionalization" was passed several years ago and the present strong tendency is toward straight one-man control—under safeguards and with staff and service assistance—at each level in the organization.

One Man Only Can Occupy the Driver's Seat

Such a delegation of authority at the top seeks to take from the shoulders of the chief executive and to spread among several functional managers, authority over specified matters affecting *all* units of the enterprise. But the attempt to avoid overlapping and misunderstanding between functional managers and operating officials through detailed definition of fields and functions, results in a degree of hairsplitting and a mass of fine-spun distinctions incomprehensible to most persons and impossible to enforce in practice. For one cannot touch finance or cost without touching planning, nor planning without touching personnel, nor personnel without touching methods and costs—they are all inextricable components of one job: that of obtaining the major objective for which the institution exists.

The practical result, therefore, is that there are constant battles between these functional managers as to their respective prerogatives, and constant appeals to the chief executive for the settlement of differences, for arbitration and for co-ordination. The executive either becomes so occupied in refereeing these fights that he has little time for constructive and all-embracing leadership, or he becomes saturated with such appeals and leaves his subordinates to straighten out their own differences as best they can; real teamwork and co-ordination go by the board.

In effect, then, it leaves to each of these managers the duty of co-ordinating his own special interests in their relation to the often conflicting and contradictory interests of his equals in the organization plan; he must, in other words, in innumerable details of his daily work try to co-ordinate his own function with the functions of others who have authority equal to his own—a psychological and practical impossibility.

Truly effective co-ordination is possible only with straight line delegation of authority and can be brought about by one man only: the chief executive himself. The attempted delegation of authority according to functions which affect all operations under him is a virtual abdication of the executive's own authority. As a profoundly wise man said many years ago "an two men ride of a horse, one must ride behind." No major executive has yet been able for long to shed from himself responsibility for the exercise of functions which inherently attach to his own person.[2]

Functional authority in the upper levels ordinarily creates endless misunderstanding, buck passing, and difficult-to-control grasping for power, with all that these imply. In ramified undertakings it raises problems of co-ordination virtually unsolvable because the diffusion of powers at the top results in a hodgepodge of instructions below. It is the exceptional group indeed which can function harmoniously and effectively under an organization with many bosses at the top.[3]

Worst of all, because of the deadening effect on *getting things done,* functional authority at the top has usually resulted after a short time in a feeling of futility, and in lowered morale.

Such attempted institution of functional managers near the top, furthermore, is as unnecessary as it is unwise. There is no inherent need of such functionaries with authority at the top—as has been pointed out elsewhere one can bring all of any individual's expert

[1] "But when his (Taylor's) conception of division of responsibilities by function is carried higher up the line of control in any large enterprise, difficulty is encountered immediately." (Urwick, L., *Papers on the Science of Administration,* Institute of Public Administration, Columbia University, New York, 1937.

[2] For further discussion of the chief executive's functions, see Farquhar, Henry H., "The Modern Business Staff," *The Society for the Advancement of Management Journal,* May, 1939, Volume IV, No. 3, pages 60-67.

[3] I believe there is little question that the widespread use of functional "managers" near the top in government is a prime cause of much that we decry today in the "dead hand of bureaucracy." "Too many bosses" at this time is a near-fatal obstacle to speedy and unified war effort so far as the government's part goes.

". . . unco-ordinated and confused responsibilities and authorities . . ."; ". . . no one authority who seemed to think that he was, or knew who was, in entire charge . . ."; ". . . no over-all command . . ."; ". . . sixteen agencies of Federal, State and local governments exercising various and at times overlapping jurisdictions . . ."; "the line of demarcation . . . was much confused . . ."; "The commandant did not consider himself either in charge of the situation or to be the responsible . . . officer present. Other officers were under the impression that he had assumed the responsibilities. He considered (another department) to be in charge . . ."—such, according to the House Naval Affairs subcommittee, are some of the causes of the burning of the *Normandie.*

(*Please turn to page 83*)

Union Participation: Key to Greater Productivity[1]

By CLINTON S. GOLDEN

Director, Northeastern Region, Steel Workers Organizing Committee

and

HAROLD J. RUTTENBERG

Research Director, Steel Workers Organizing Committee

OUR experiences indicate that the greater the participation of workers through their unions in setting piecework and tonnage rates, in making time and motion studies, in determining work standards and job evaluations, the greater are the earnings and output.

The industrial relations director of a large rayon firm in July, 1941, arranged for the local union committee from one of his plants to visit SWOC's office in Pittsburgh for the purpose of learning the practical methods through which SWOC members and local unions participate in working out incentive wage plans. Joseph Scanlon, who is in charge of this phase of SWOC's work, spent two days with the committee, and took these leaders of a CIO textile local union to a few steel mills for firsthand observation. They acted as if they had stepped out of a hopeless industrial scene into a dreamland; the difference, actually, was between the arbitrary establishment of wage rates by management and union participation in doing this job. For all practical purposes this textile workers' union committee could have been the SWOC committee from any one of a majority of SWOC's local unions, because most of management still feels that this job is none of the union's business. Joseph Scanlon, who has had twenty-odd years of intensive and varied industrial experience, casually reported to us his two-day visit with the textile committee, and we quote from his report directly because it is so sharply to the point:

> After several hours of frank discussion with the committee from the rayon company I got the distinct impression that if the management had tried its utmost to do everything the wrong way, it could not have equalled the success in that direction that it has attained. About a year and a half ago a stranger suddenly appeared in the plant. The employes had no idea who he was or what his function was to be. He, together with one or two assistants, began installing a merit rating system. Of course this was somewhat of a mystery to the employes. This naturally created a chaotic condition and a great deal of resentment developed. It was evident that even the supervisory force didn't understand it all and many of them were suspicious and resentful. Probably because of this bitterness and the advent of the union, this plan was discarded. However, the suspicion and bad taste remained.
>
> Several months ago the same man who installed the merit rating system began making time studies of the operations in the pipe gang. There was no preliminary ground work, no explanations of the objectives—just a man of mystery with a stop watch. Some of the people being timed asked questions but were denied an answer. Recently the men on the pipe gang were informed that standards had been set and it was proposed that they work on an incentive plan. Suspicion, resentment and distrust resulted.
>
> Evidently it was at this juncture that the company's industrial relations director took hold and expressed a desire to approach this problem intelligently. Certainly I hope he carries on, for some of the tales of delays beyond the control of the pipe gang due to the lack of correct tools, even down to the utter impossibility to secure a proper wrench, signify the old economy of "save a dime and spend a dollar." Witness this contrast. At the ABC Steel Company, the union was consulted before the company made any decision on incentives. A detailed explanation was given and a common understanding was reached. For the past two years four union members, including the secretary of the local union, have been working in the Time Study Department. All standards are checked and agreed upon before they are put into effect. After a trial period a recheck is made if the standards are unsatisfactory. The time studies and standards are an open book and can be inspected by all interested parties. No mystery, no secrecy—just a job to be done and one that can be done best with full union participation and understanding. The visiting committee was given a detailed explanation of every phase of this program. They were so enthusiastic about it that they were still in the mill at seven in the evening.
>
> The next morning we visited the XYZ Iron Company. Here again the visiting committee found the union participating to the fullest extent in making time studies and setting standards. The job here is nearing completion. The union secretary and a member of the union negotiating com-

[1] Reprinted by permission from *The Dynamics of Industrial Democracy*, Harper & Brothers, New York and London, 1942.

mittee are working in the Time Study Department. The visiting committee found the situation entirely to their liking. and freely expressed the conviction that if the problem of wage incentives and job evaluation received this sort of treatment by their management, they would certainly participate and co-operate to the fullest extent in the program. As you know the committee left us with the enthusiastic determination to make every effort to have their company follow the pattern set at these two SWOC contract firms.

As a result of this experience I would like to make several observations. If the Industrial Engineers of today would tear the veil of secrecy and mysticism from the application and operation of their innumerable wage incentive plans, we might be able to achieve a mutually satisfactory acceptance of wage incentives. In most cases they remind me very much of the old tin mill roller who made a profound mystery of the art of rolling tin until someone eventually came along and discovered it was quite simple.

It seems to me that this question of installing a wage incentive plan should be handled as frankly and as simply as possible. In the past few days I have received several letters from our local union people on this subject. One letter from Connecticut tells us that the union is badly in need of expert advice and counsel from our office. They registered a protest because they believed their standard had been set too high and had resulted in a wage reduction. Thereupon, management informed them that since they were entirely ignorant of the technique of industrial engineering, it wouldn't be worthwhile to even discuss the setting of standards with them. This is an insult to the intelligence of our people in the mills and factories.

Any wage incentive plan, any standard that has been set, that will not stand frank open discussion and complete explanation to the people concerned, leaves a lurking suspicion of unfairness and dishonesty. Why not tear loose this veil of secrecy, this air of mysticism and approach the problem as follows:

Management should go to its employes and say, "Now look here. You fellows are working on a straight hourly rate. Some of you are working faster than others and perhaps we are not paying you as much as you actually are worth to us. Again there may be others who if we furnished the opportunity for increased earnings might be able and willing to increase production. Now we want to make some time studies, but we are not going to do so unless we have your co-operation and participation so that proper standards may be set. If there are any errors in them, these errors will be ours and yours and together we can correct them. We shall arrive at these standards, not by timing the fastest or the slowest employe, but the average one. We shall credit you with a certain percentage of fatigue time. This naturally will depend upon the intensity, monotony, and physical requirements of your particular operation.

"We shall guarantee you a fair base rate so that security and stability of earnings will be protected. At eighty percent of this standard we shall pay you a bonus. Undoubtedly many of you will be able to make up to 125% to 130% of your base rate, but this does not imply a penalty on those who are unable to do this for naturally we know there is a vast difference in the speed, efficiency, and ability of our employes. Last and most important, each employe should tabulate all delay time that is beyond his control; for instance, lack of, or defective, material, tools, cranes, and so forth. We will deduct this time from your production time and pay you your base rate so that it will not interfere with the possibility of earning a bonus. We will charge all of this delay time as an expense against your department supervisor. Of course, this will keep him on his toes, and likewise will permit us to figure accurately whether or not, on the basis of delays registered, we can justify the expenditure of capital to eliminate delays which cannot be corrected otherwise. The more you make, the better we will like it, and we will not disturb the standards, for the more you produce and make, the lower our unit costs become. This we will put into an agreement with your union."

I believe this would put the proposition on an understandable basis and that our local union people, if approached in this manner, and invited to participate and co-operate fully, would look more favorably on the installation, or if the situation is otherwise, on the maintenance and improvement of wage incentives.

Less than two years ago Joseph Scanlon was operating a charging machine in the open-hearth department of a steel mill. This report is not a blanket endorsement of wage incentives, as Joe Scanlon strongly feels that flat hourly wage rates with measured production is the ideal method of distributing to workers their share of the proceeds of production. Instead this report is a typical worker's attitude toward wage incentives after he has reconciled himself to their existence, and the necessity of adjusting himself to working with them—at least for the time being. It is a blanket attitude that applies with equal force to merit rating, job evaluation and other devices designed to place the question of wage payments on a more or less factual basis. Before examining the positive results from direct participation of workers and their unions with management in the job of setting wage rates, work standards, and so forth, it is first necessary to examine the negative results—in earnings and production—from the denial to workers and their unions of such participation.

At this point in our discussion we call upon outside authority to substantiate our views and experiences. The Western Electric Researches, conducted by Dr. G. Elton Mayo, of the Industrial Research Department of the Harvard Graduate School of Business Administration, and associates, in conjunction with the management of the Hawthorne Works of the Western Electric Company in Chicago, from 1927 to 1932, are the most significant body of evidence on the group behavior of industrial workers that has come to our attention. In every major detail the findings of these researches par-

allel our experiences. The unique feature of the final conclusions of these researches is that they are elementary truths that experienced people in industry, management and union alike, ignore or take for granted in too many instances. Two intensive experiments were conducted, one among six girls in a test room and another among the Bank Wiremen in an observation room.

In the latter case it was found that:

1. An informal organization with a leader existed among the Bank Wiremen, whose observable purpose was protective in that the informal organization opposed "rate busters," "chiselers," and "squealers."

2. Although the employe participated least in the technical organization, he bore the brunt of most of its activities.

3. The communications system—the passing of data up the line and policies and data down the line—was observed to be a failure in both directions, up and down.

4. This informal organization gave the employes "a certain feeling of security," and the principal discovery of the research program was that the employes were "unconsciously attempting to protect themselves through their informal organization from real or fancied consequences of supervisory practices and technical innovations."

The researchers supplemented the Bank Wiremen experiment with intensive interviews of a select group of employes to further "study the social relations of people actually at work on the job." These interviews revealed that "workers were banding together informally in order to protect themselves against practices which they interpreted as a menace to their welfare." Specifically they (1) were against wage incentives; (2) pegged production standards and enforced them; and (3) showed "preoccupations of futility with regard to promotion."

The Bank Wiremen and the employes generally at the Hawthorne Works of the Western Electric Company were not unionized at the time, 1927-1932, nor are they now. Management, as a rule, when it finds such practices among unionized workers points the finger of accusation at the union when, actually, these practices predate the union's birth by many years, and are merely being carried on by the union because it has been unable to eliminate the underlying factors that compel workers to oppose group wage incentives and production standards. In fact, one of the earliest contributions of organized labor to productive efficiency is the way in which it alters the attitudes of workers to group wage incentives and lifts these self-imposed restrictions on output. More on this later.

The results of the test room experiment were the very converse of the Bank Wiremen one. The six girls who participated in this experiment were given, at regular intervals, improved physical conditions of work with ideal rest periods. As was expected, production rose steadily with no observable increase in fatigue. Had the experiment stopped here, the conclusion, of course, would have been that the improved physical conditions of work were exclusively responsible for the increased output. The researchers, however, were not convinced that this was a sound conclusion and sought concrete evidence to uphold or disprove their views. This evidence was secured by taking away step by step, at the same regular intervals as they were installed, the several improvements in physical conditions of work and rest periods that had been given the six girls. Instead of declining, production continued to rise steadily. The obvious conclusion naturally, was that the steady rise in output was not related to changes in the physical conditions of work, but to the development of an organized social group in a peculiar and effective relation with its supervisors. This was so, the experiment revealed, because:

1. It was fun in the test room for the girls as they were not prohibited from talking to each other during working hours and for other related reasons.

2. "Employes must have confidence management is doing things for their welfare."

3. "Something in their experience of industrial life produced in a number of employes a conviction of personal inadequacy."

Had similar investigations been conducted concurrently throughout the whole of American industry substantially the same findings would have been revealed. Management in each mine, mill, and factory that has seen its employes organize into a union in the last decade, or is seeing them do it today, can find evidence of the validity of the Western Electric Researches in its own backyard in the existence of a union among its employes. Because for all practical purposes the findings resulting from these researches and the motives for union membership among workers are the same. These researches therefore constitute a study of the origin of labor unions; for example, they found that "although he participates least in the technical organization, the employe bears the brunt of most of its activities." As a direct result an informal organization with a leader developed among the Bank Wiremen long before they

participated in the experiment. The purpose of this informal organization was essentially protective, which made its activities negative; that is, the group through its leader opposed "rate busters," members of the group who exceeded production levels, because of fear management would set higher output standards and reduce their per unit earnings accordingly. Likewise "chiselers" were opposed, as they jeopardized the earnings of the entire group by slackening on the job. And, of course the group opposed "squealers," because they tattled on its secret doings. The researches also found that this informal organization gave the employes a "certain feeling of security."

In this respect one of the directors of the researches observed that "these informal organizations much resembled formally organized labor unions." In fact, they are the forerunners of labor unions. In going about the task of organizing a group of workers in a given plant into a labor union, we have consciously sought out the leaders of these informal groups throughout the plant, interested them in taking a lead in forming the union, and found that their joining the union, invariably caused the members of the informal organizations to follow suit. In labor union parlance these leaders are called "the men with a following." Thus the leaders of the informal organizations take up leadership in a formally organized labor union, in part, because of "preoccupations of futility with regard to promotion," and the rank and file of the informal group members join because, as the Western Electric Researches also reveal, "something in their experience of industrial life produced in a number of employes a conviction of personal inadequacy." The Bank Wiremen pegged output because they were denied a voice in making the decisions that vitally affected their everyday lives, while the Test Room girls, as a result of having a voice in such decisions, continually raised output and apparently had no thought of engaging in restrictive practices. The factors in the lives of the Bank Wiremen that forced them to peg output were absent in the girls' work environment. Many other factors, of course, were at work in both cases—this we fully appreciate—but the denial of an effective voice in one case and its presence in the other constitutes, in our judgment, the dominating factor in these two experiments.

Do workers, who engage in practices like the Bank Wiremen for the same reasons they did, join unions to continue them, or to free themselves from the compelling factors that in their non-union state of affairs forced them to peg output, oppose group wage incentives, and so forth? Our experiences in this connection have been unanimous. Whether the informal organizations of workers in a plant continue their negative purposes in a formal labor union, or whether they are converted into positive and constructive channels depends, in the main, upon the attitudes and policies of management. Give workers as a formally organized group a say-so in setting wage rates, work standards, job evaluations and in making time and motion studies, and they will produce all they can within the limitations of physical endurance, health, and fatigue; deny workers such a say-so and they will engage in restrictive practices out of self-protection. The fact that in so doing they may impair their economic interests will not deter them in the slightest. Let us look at some typical cases that clearly tell this story; in the first case the negative purpose of the informal organizations was enlarged. In the second case the negative purpose was also enlarged at first, but was then converted into a positive one.

Number One Company is a huge enterprise, much in the news these last few years. The basis of its operations is the assembly line. Its employes, as elsewhere in the auto industry, had organized into informal groups starting the first day the assembly line was put into operation more than a decade ago. Through their informal organizations workers on these lines had perfected ways and means of keeping production at certain levels just as the Bank Wiremen did. Each year management changed the speeds and rates of pay of the assembly line; the men were not consulted. The new speeds and rates of pay were announced after management worked them out through its own Time Study Department. Denied a direct voice in the establishment of assembly line speeds and rates of pay, the men exercised an indirect influence through these informal groups. In 1936 and 1937 they formed a CIO industrial union for which 90 percent of the men voted in an NLRB election. Management opposed the unionization of its employes. Consequently they continued the negative purposes of their informal groups when transformed into a formal labor union; in fact, they enlarged them.

One of the purposes of the informal groups was to peg output. This had been done for years prior to organizing into a labor union, because, as previously noted, these workers were denied direct participation in the determination of assembly speeds and rates of pay. Management rejected the demand, arguing that if granted, it would be an infringement on its prerogatives.

Thwarted at the outset in changing the underlying cause of their restrictive practices on production, they continued to participate in setting assembly speeds and rates of pay through the indirect methods they had perfected over a long period of years. When expanded on a larger scale than under the informal organizations, the pegging of production became clearly observable to top management. Lower supervisory officials had known all about it, even co-operated with it, as did the minor management officials at the Hawthorne Works of the Western Electric Company.

Upon learning of these practices top management officials charged the union with sabotage, and for exemplary discipline fired the leaders in one department. The rank and file of these auto workers, who had followed these leaders for years, refused to work until they were reinstated. This power to stop production completely that workers acquire through a labor union is something they did not enjoy through their informal groups. Union spokesmen charged a lockout; management spokesmen claimed the union had called a strike. The dispute raged for two months, and was finally settled on a compromise. Management would continue to set speeds and rates of pay by itself; but if any speeds or rates were unsatisfactory to a worker or group of workers, then the management would reset them in co-operation with the men and the union representatives. This was in 1939 and not all is in order in this company's plants now, nor is it likely to be until management clearly comprehends the meaning of the basic demand for participation of which restricted production is merely one manifestation.

Number Two Company with a union shop contract now enjoys the benefits of the positive and constructive activities of its employes' union, but first went through a year and one-half period during which its employes enlarged their negative activities before engaging in positive and constructive ones. The central point of difficulty was the establishment of piecework rates. Prior to the union organization management had set piecework rates itself and reduced them when the men exceeded their expected production and earnings. There naturally developed an informal organization among the men to hold production at certain levels, as the Bank Wiremen did. After they merged their informal groups into a formally organized labor union the men were able to make higher earnings on lower production, because management had raised their piecework rates from 20 to 60 percent to prevent them from organizing, but in vain.

Eventually management complained that production was falling off, and admitted its costs were out of line competitively because of the wage raises it had granted to stop the union. The men resisted management's request for a lowering of piecework rates. Management argued that they could maintain their earnings by raising output, but the men were interested in their earnings foremost. And if they could realize satisfactory earnings on a given output they were not interested in raising output to maintain them.

An agreement was finally reached guaranteeing piecework rates for a period of one year. The company's product changes yearly; management, employes and the union establish the piecework rates each year by joint determination, and they continue unchanged until the following season. Knowing that their rates would not be changed, the men no longer restricted output. Production rose unbelievably; management benefited from greater output and the men from substantially higher earnings. At Western Electric's Hawthorne Works the researches revealed that "workers were banding together informally in order to protect themselves against practices they interpreted as a menace to their welfare." This is the way the employes of Number Two Company felt about piecework rates until the rates were guaranteed for a year, and they had an effective voice in setting them.

The employes of this company have found satisfaction, by and large, for the economic, psychological, and social motives that impelled them to organize into a union. Behind the statistics on Number Two Company's production and its employes' earnings is an absorbing human story. From May, 1936, the last month before the union, through the year 1939 earnings in each department rose from a minimum of 27 percent to a maximum of 191 percent. By the fall of 1941 earnings had risen over May, 1936, a minimum of 42 percent to a maximum of 205 percent. Daily output rose during this five and one-half year period from seven hundred units to seventeen hundred, or 143 percent. Unit costs were down by almost a third, and the company's net profits have reached their highest levels in 1939, 1940 and 1941. In the depression year of 1938 the company stayed in the black.

There are six companies in this line of business, not one of which is within 25 percent of Number Two Company's average hourly wage rates, but yet the latter is able to undersell them consistently. Five-dollar-a-day buffers have become twelve-dollar-a-day men. Six dollar-a-day polishers have become seventeen-dollar-a-day

men. They are typical of this company's thousand-odd workers. They have moved into better homes or built them in the last five years, and otherwise raised their living standards. They have found security on their jobs, greater prestige in their communities, and have overcome the personal frustrations and inadequacies induced by the pre-union managerial policies that forced them to engage in essential negative practices. Further, in their daily work they have found an outlet for their creative desires as they are free to make suggestions to increase efficiency, eliminate wastes, and so forth. As a consequence production has risen steadily. This is not the diabolical speed-up brought about by force and compulsion, it is the attainment of a higher production by the willing and voluntary co-operation of a group of workers with management.

The company's slogan is, "We don't care how much you earn, just so our unit costs go down." Because of a mutuality of interest, this policy has proved economically sound; the days that polishers, for example, make twenty dollars, the company's unit costs are the lowest. The company president says, "Not only have our work standards and wage incentives turned out to be more sensible and practical since our employes participate in making them; but once they are set, being self-set, they are adhered to willingly by the men and with a certain pride." What workers, like all folks, have a part in, they not only understand, but they feel responsible for carrying out successfully.

This case is far from being an exceptional one in fundamental principle. The exceptional nature of it is the complete manner in which management, led by an astute, able president, has cashed in on full co-operation with its employes' union, and the union has secured maximum benefits for its members through full participation. Without a single exception the four hundred and sixty-six wage cases that have passed through our offices, either in final appeal to management or to arbitration, from March, 1937, to November, 1941, bear out the basic principles that this company's union history illustrates; namely,

1. Participation is essentially a constructive and positive undertaking, and workers are neither in the frame of mind nor the position, except in a limited way, to co-operate jointly with management in decisions on wages and standards, or in reducing costs, or wastes, and so forth, until their union's status is secure and permanent through the union shop form of recognition.

2. Greater results in production and earnings—to workers in wages and owners in dividends—are achieved when wages are set, jobs are evaluated, and work standards are determined jointly by management and workers through collective bargaining, than when management does these things solely and arbitrarily.

Further evidence of these principles is found in *The Iron Age,* a trade journal in the steel industry, which reported on February 6, 1941:

> One reason munitions contracts being manufactured by Massachusetts firms have not been speeded up is said to be a feeling among workers that if they make more than $40 or $45 a week on piece work, the rate setters would cut the pay rate. If piece rates were frozen at current levels for the duration of the emergency, it is said, output could be tuned up at least 25 percent.
>
> Knowing his workmen, a Springfield, Mass., manufacturer of fire arms with British government contracts recently enclosed the following notice in pay envelopes:
>
> "Smith & Wesson wants to do everything possible for defense, and to that end asks all employes to help. Production is needed. The company in order to assist in defense work announces that no reduction in any piece price or day rate will be made on such work. Make all you can and the more you make the better we will like it. Harold Wesson, President, Smith & Wesson, Inc."

We have not inquired into the results of this pay envelope announcement. But if it has not produced the desired results it is not because *The Iron Age* preface to it is inaccurate. It is because the employes, lacking a union, collective bargaining, and direct participation in these vital matters—or if they have a union and collective bargaining, lacking the security of a union shop—did not feel free to walk through the door Mr. Wesson opened for them.

Joint union-management co-operation on such elementary matters as wage rates, job evaluations, and seting work standards develops a pattern of co-operation that can be used later for more fundamental matters and on a broader scale. When collective bargaining in a local industrial establishment reaches maturity it is then possible for the union and management to co-operate to increase efficiency, reduce wastes, and otherwise cut costs of production.

Before union-management relations can reach such a state of maturity, however, it is first necessary that the principle of the union shop form of recognition be incorporated into the collective bargaining contract. Though this is not a cure-all formula, yet it is essential to opening the door to higher earnings and greater productivity.

New Management Views in Today's Hysteria[1]

By O. G. VAN CAMPEN

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A NEW worker experiences definite problems in his attempt to adjust himself or to conform to the plant behavior so that he ceases to be a "greenhorn" and becomes one of the "natives." Anyone who has done consulting work is aware of the need for a speedy and accurate absorption of the plant behavior, language, and above all, a consultant or industrial engineer becomes highly conscious of a plant's "tone."

The thinking of the superintendent, running down through the foreman or supervisory group, definitely creates standards of relationships—human relationships and relationships to work that soon become molded into a plant standard, or "tone." There we see the thinking of executives rapidly becoming focused, and in due time there has come a by-product, which is known as the characteristic plant "tone."

In some plants, for example, the tone is severe, tight, requiring strict conformity to standards. This is particularly true in precision plants—optical, fine gauges, machine work within very narrow tolerances. Out of the precision of the work, of course, is developed a type of man capable of doing precision work. This type becomes more impressive as it becomes a group—the single individual multiplied into a working force, out of which in a number of years there grows a pattern. The superintendent, the foreman and the entire plant thus are patterned after a definite behavior with a specific code, a specific relationship of values which ultimately becomes the philosophy and the thought process and human relations standard of the plant.

In other plants the plant tone is loose. One might term it almost "sloppy." This is particularly true in plants where the skill is less highly developed, where precision does not appear except with a very broad tolerance relationship; and then the quality of goods manufactured has much to do with the type of person willing to work in that particular plant, drawn to that plant and supervised by the type of executive that is the by-product of that plant.

Those of us who have been identified with a particular company for a number of years have lost sight of the degree of grooved thinking that is characteristic of the plant in which we work. So deeply do habits of behavior, conformity, procedure, become grooved in our lives, that the attention ceases to note it, and it all becomes lost behind mental blind spots, until finally you take your institution for granted. It is "right" because it endures, because it produces and because it survives; the behavior, the deportment, the conduct, the beliefs, the points of view, are right because they are a part of that which you serve or are identified with.

Institutional Thinking

It is interesting to note the institutional thinking that is characteristic of industrial America—in the different kinds of plants and shops and stores. Only those who have gone from plant to plant, who have not been so grooved by long contact, by deep immersion in a specific plant, can appreciate the degree of static standards that institutional beliefs ultimately inculcate into those working within them—this plant "tone" surrounding the product, the profession, the tradition of the industry.

It is this institutional philosophy, this institutional code, this institutional creed or point of view that is perhaps the most solid resisting force that must be broken as America seeks to meet the emergency with which it is confronted. There are still hundreds of thousands of executives throughout our country that can be numbered among the die-hards—those who resist, even viciously, the changes in the industrial, social and economic relationships being brought about by the great pressure of the international situation.

Man, when he becomes identified with an institution, tends to intensify his prior conceptions or convictions or individual code to the point where there can be no other than his point of view and his approach. Perhaps the one best way to penetrate, to dissolve—I do not like the word "breakdown"—the resistance caused by industrial or conditioned thinking, is to introduce a new vocabulary, new word symbols, thought symbols, born out of a new field of investigation and research; a new field that offers new techniques.

[1] Paper presented at a meeting of the Philadelphia Chapter of The Society for the Advancement of Management, October 23, 1941.

Outline of Civilization

The other night I flew in to New York City at night, as I often do, over part of New Jersey and New York, and I saw the city beneath—twinkling lights spread in a kind of fairylike fabric over the flat of the earth below, presenting an illumined pattern that really outlined what we call civilization—civilized America. Tucked beneath those lights in the many thousands of homes visible from the plane were human beings; within those homes in which they lived, beneath those roofs that covered them, wherever the lights twinkled, was another kind of institutional belief, called the belief, or point of view, or social code of the home.

I was impressed with the fact, as I looked down upon those twinkling lights of those many thousands of homes, that undoubtedly there was definite variance in the philosophy in each one of those homes. Yes—as in industry, there were common principles believed in by all the people in all those homes. There were certain points of philosophy or ideals to which all people in those homes conformed. Yes—but while there were fundamental driving ideas and motivating ideas, there were these variances: each home modified the parental, the filial relationship; the relation of the home to the community, to its church and social obligations; its relation to the city, the county, the state and the nation.

An impressive thought, an impressive picture—from the dome of the Perisphere at the World's Fair—came to my mind in close-up, perhaps sequential to the view of the twinkling lights. As I sat in the plane looking down at the lights, I suddenly recalled the picture that had been flashed on the dome of the Perisphere. You probably recall it too.

This great dome was quite symbolic of the space we assume is somewhere in the heavens—it was a curved dome, a lofty thing—and on its inner surface was projected this motion picture serial of people walking, endlessly walking by the thousands, by the hundreds of thousands, by the millions. They were the workers of the nation, coming ever, from birth to maturity, out of homes all over this country of ours, over all the world—this endless procession of young men and young women who clamor at the gates of our plants and factories and stores, asking for the right to a livelihood, to shelter, to establishment.

Broader Scope for Thinking

With these great masses coming in endless procession, year after year to American industry, the fixed thinking of the institution must give way to the broader scope, the wider concept of realization of the demands, normal and just, of these hundreds of thousands of people who come to us asking what we can do for them in order that they may carry on in homes of their own. Institutional thinking must spread until it is closer to the pulse of the thinking, the motives, the aspirations, the hopes and fears of these ever-coming masses.

John Wanamaker used to say that when he wanted to sell hats to women he would sit on a bench in the park and watch the women go by, and then he would have a milliner make just such hats as the people were wearing. He would sell them back to the women—and they bought them and were quite content. John Wanamaker's then was a young institution; it was close to the pulse of the people.

It is interesting to contemplate the great change that has taken place in women's hats. The milliners, the stylists and the manufacturers have gotten together with Hollywood and the publishers, and we men have to stand for the monstrosities they call female headgear. It is rather an amusing approach to the idea that the women no longer decree the kinds of hats they wear. The technique of advertising, style, and manufacturing in large quantities has squeezed and shaped the thinking of woman until she must wear the hat that the stylists provide for her. Because it is something new, and because women cannot find any other kind of hat, they obey more cheerfully than we men would if somebody told us what we had to wear in the way of headgear.

The Institutional Ego

It is strange how the institutional ego does develop. When the institution is young it seeks to cater to its market; to its buyers. As the institution becomes larger, greater, with widespread branches, it develops a kind of false security, a kind of institutional consciousness, and soon it seeks to bend and twist the worker to its kind of thinking; to its needs, and soon we have the conflict-issue, which is—"do, or else!"

These masses are being awakened today as never before in the history of our civilization by influences that were not heard of twenty-five years or so ago.

It is true that after the first World War labor became alive to its power as a mass; it is true that the people of that generation were aware of their importance as a mass of workers, or as a mass of soldiers. But even then the men who were soldiers and the men and women who were workers were still half-believing in the ideals

that the older generations had sown in their minds. In the opening days of the World War we could be lured into participation in such a conflict by phrases as, "to make the world safe for democracy," etc. I submit that the present generation would laugh you to scorn were you to attempt to lure them by any such simple catch phrases as were used at that time. As far as their attitude was concerned in participation, in production or in military service, the appeal was true; in so far as their labor relations were concerned, the power of money, the power of ownership, the power of the stockholder, the power of management of the old order, still held sway.

But, we had a depression in 1929—the last echoes of the war of 1914 to 1918 were brought to consciousness again at the sharp disillusionment on the part of the masses—when everything went to pieces. The hundreds of thousands of Legionnaires, many of whom were parents, the younger generation who had heard the conversations at the dinner table, were aroused again to reconsider the hollow philosophy of the older thinkers in connection with patriotism, working your way up from the bottom, serving your company and being loyal. Much of that philosophy became to them a mockery, particularly when a man's belly was affected, when layoffs occurred, when the dole and the bread line confronted them. These shocks of 1932, creating a kind of consciousness that we had not confronted before, brought about a sophistication in the thinking of the masses that must be recognized—a realism, harsh, and perhaps distorted, but nevertheless, a realism.

Disillusionment and Unionism

Industry cannot force its institutional methods, techniques, codes, regulations upon this more awakened and more highly sophisticated working mass. Added to the shocks resulting from the disillusionment of the depression was the stimulation of organized labor and a rise of the conflict within the ranks of unionism, represented by divergent organizations with their intense, unfair, distorted competition.

We recognize today that these masses of workers, including you and me—of course we may have on a white collar and may have a clean face, but we are still part of this great mass—present collective and individual problems that are economic in nature, sociological, industrial, psychological. We recognize that we, as representatives of American industry and the techniques within it, must develop that broader point of view that enables us to think in terms of the problems presented in this working class.

Our task is tremendous. To break in upon the fixed beliefs and fixed philosophy of management today is an extremely strenuous thing. Perhaps the greatest evidence of our misunderstanding of the aspirations, objectives, and motives, needs and problems of the working masses is our—I was going to say "pathetic"—methods of supervision.

It is interesting to note that the methods of enforcing discipline in plants today are patterned very definitely after Mamma's or Papa's method of punishing Willie. The effort to make the punishment fit the crime seems to be the scientific approach to the average superintendent in the plants. How many times in foremanship courses and in other writings on the subject one finds such phrases as "maintaining discipline," "enforcing discipline."

Many machine shops use as one of their corrective measures the posting of a man's name on the bulletin board when he spoils a certain degree of work. It is felt by the management—and some of the superintendents will fight you if you attempt to change this philosophy—that the humiliation resulting from such publicity will cure the man from ever doing such a thing again.

A Pathetic Delusion

The behavior of foremen as they seek to compel obedience, to compel quality workmanship, to compel compliance with regulations, is added evidence of our misunderstanding of the obligations and responsibility of management toward the great American working force. If we contemplate the relationships within a plant we find also that management seems to be the victim of a very serious and very pathetic delusion. From the superintendent to the foremen to the gang bosses there is ever-apparent the feeling of ownership. In other words the conduct, the emotional attitude of the superintendent is that of an owner. It is "his plant," and in many companies today where there are branches, particularly in the coal industry, they believe that it is right philosophy to teach a superintendent of a mine or a plant to think of it as *his* plant, *his* property, *his* people.

This has been regarded as a method of awakening the responsibility in the superintendent for the investment involved, or awakening in the superintendent a certain pride resulting from the development of that which he,

the superintendent, possesses, or the branch manager possesses.

It is known that within institutions today, the larger ones particularly, there is the constant effort on the part of the higher executives to protect the prerogatives related to their specific offices, and to enforce regulations in such a manner as will preserve the dignity, authority or function of each particular office.

These are thumbnail sketches of fixed thinking that I submit to you—fragmentary snapshots of patterned thinking, set against the larger background of a seeking, yearning, hungry horde of human beings who are just as individual, just as distinctly different as you and I—with all the various problems presented by their individual differences.

I am led to make a strong statement: organized labor knows quite definitely what it wants of management; quite specific lately are its demands. It is of no value to enumerate them; we are familiar with them. The point is that labor headed by its leaders, knows what it wants. Its demands have been set up into a kind of platform, and there it is, presented to industry and management.

It is felt that the political situation has been too partial to labor and not sufficiently fair to management. I believe that this is true, but the "whys and wherefores" are not for this particular moment. The fact remains that management feels that the New Deal, or its legislation, has not been fair to the needs and the requirements of management.

But what has management to offer as a selling proposition to offset the well-developed and well-defined code or platform presented by organized labor? Labor is specific in what it wants. Whether that is distorted is not the point—it is specific. What has management to offer labor that is equally specific and well defined? Therein lies the problem.

Workers' International Appeal

It is interesting to note that the international appeal from across the seas comes from the worker to the worker. It was stated over the radio the other day, and in the press, that certain sections of English labor were demanding assistance; they were demanding an active offensive in Russia from England, and there was a footnote adding that it was felt that the demand for an active expeditionary force or invasion was made by the Left Wing, the Communist group, within English labor.

That is very significant! It is rather a pointing to the fact that labor is becoming more loyal to itself, to its organizations, to its international brotherhood, to its human bond; more loyal to these things than to the national flag and government in which it works. An appeal from the workers of England to the workers of America; an appeal of the workers to their own government to go and help out Russia, man-for-man—the expanding of the philosophy of the individual and of the group until it becomes an exclusive influence that is world-wide. Yes, labor is discovering its mass power; labor is discovering its mass influence and its constructive and destructive power.

I ask again: What has American industry to offer to counterbalance the demands of the worker, of the organized labor union?

Much stress is being laid upon collective bargaining and, to a great degree, there is a satisfaction felt by labor because it has reached the place where it has the power to compel collective bargaining. Labor is beginning to feel that it is getting benefits and that they come from collective bargaining. To a certain degree management benefits if collective bargaining can be carried out according to contract and on an ethical basis. But whenever we speak of compromise we imply conflict. That is because of the fact that compromising a conflict for the moment has set aside conflict, or rationalized it. The conflict must arise again, and again, and again.

Those of us who have had any experience in negotiating union contracts know perfectly well that we compromise only from year to year. We find that whenever we talk about bargaining we imply an exchange of something—a temporary setting aside of conflict between management and labor. Wherever we have such conflict we cannot, and we do not, have any form of lasting development.

Collective bargaining is not and cannot be the end of the efforts of management and labor in a democracy. It serves for the moment; it represents a step in the right direction. But again I ask the question: What has management to offer labor as a constructive platform with which management hopes to offset or counterbalance or compensate, in the eyes of the working man, the platform of organized unions?

Shall the institutions continue to believe, according to the old pattern of thinking, that the institutional code and ethics, doctrine and philosophies must be defended and must be maintained? Must management continue to feel that its conflicts are partly political, partly economic, and partly industrial, and that conflict is its only outlet and outlook? Must the fixed belief of the presi-

dent and vice president continue to motivate the foreman with its mistaken idea of ownership, authority and enforcement, discipline and reward?

Lessons Gained from Hitler

The answer cannot lie in this direction. The need is far greater. It is with a sense of unwillingness that I acknowledge that Hitler has taught us a great deal about handling men, selecting men and training men. I mean Hitler and his staff, his representatives and his organization. We are learning by watching this well-timed, gigantic machine that seems to be the last word in training, in putting the square peg in the square hole, in getting maximum efficiency out of the functioning of mind, aptitude, skill and physical reserve. We have advanced twenty-five years here in the United States. The pressure of these months has thrown our thinking ahead. In the quiet stability of 1925-1927 we were not concerned with supervision as we are today; nor were we concerned with specific methods of training; nor were we thinking of the relationship of the foreman to quality production and to cost and to labor troubles.

However we are thinking of those things now, because the great pressure for speed-production in a minimum of days and weeks and months has forced management, against its will perhaps, to face the cold, hard fact that man, properly trained and properly supervised, is still the most important link in the production line; a link between the raw material and the shipping room; the link between the overhead in the plant and the profit and loss sheet; the link between the plant supervision and the case hearing before the labor delegates in Washington.

We are being forced to see these things as never before, and out of the seeming chaos in which we find ourselves as industrialists, discoveries are being made that are encouraging. Techniques are being developed that give promise of a better kind of solution that may be effective in the postwar era. As we seek to take supervisors from our plant floors and transfer them to new plants for which ground has just been broken, we are forced to consider more carefully the aptitude, the emotional balance, the personality qualities, the skills of the individual we pick for the supervisory job in the new plant.

Learning Ability Studied

As we seek to construct training methods that will produce, not the total machinist or the all-round mechanic, but the operator of machines, we are brought more closely face to face with learning ability, with intelligence levels, with finger dexterity, with learning processes and work habits. We are discovering now more clearly how the worker learns, how his learning period must be broken to prevent monotony and fatigue, and how time must be wisely set so that he does not waste his time needlessly overlong in some particular phase of his training; and as workers grow taut with the pressure of long working hours under speed, we are becoming, through closer supervision, more aware of the explosion points in the worker, more aware of his difficulty of adjustment, of the fact that man is a human machine that must be maintained as we now maintain the turret lathe or the milling machine or the motor.

Yes, we are awakening to a new insight, a more accurate knowledge of these things; but again—here they come thousand upon thousand, with a new sense of mass power and a new sophistication, a more realistic point of view and a more urgent demand for a right to a job.

We realize as we confront this newly aroused, half-hysterical, emotionally distorted mass, swayed by international as well as national sociological and economic influences, that our techniques must be more refined; we recognize that our philosophy as industrialists must be more crystallized to an exactness predicated upon scientific data that will enable us to—what?

Industry must meet this highly individualistic, independent, sophisticated, dynamic worker with a specific kind of structure that will be just as real to the worker as are the distorted promises and exaggerated doctrines of his union leader. It is felt by many that as a result of the hardheaded, highly sophisticated, distorted thinking of the workers, we may be faced with a labor government, particularly if we were to lose the war. Some think we may have one anyhow, whether we win or lose. At any rate we are going to face a worker conscious of his power and his importance, and conscious of his rights—overconscious of his rights. And I say again, we must present to that man an industrial management structure that will be just as realistic to him as is the doctrine of his union leader, and one that will give a greater degree of security, or promise of security, than he is receiving from the kind of philosophy in which he believes at present.

To begin with, management must recognize that work for the worker in a democracy is not something that the worker does for so much per hour or day. In other words, that it is labor hired at a price, and that alone. Management must not continue to believe that a job is

something for which a worker must qualify, must be bent, and to which a worker must conform as though that job were an institutional code. Management must recognize this: We are in, we do have and shall continue to have a democracy in America, and the industrial life of the worker represents simply a phase of the worker's self-expression through which he employs whatever skill, talent, ability he may have in some specific direction, the result of which is wages and financial return.

A Guarantee Required

We must think of work as a means or a form of activity that will enable the worker to grow from the stage of an apprentice to the higher job at the higher financial return to him in order that he may marry, establish a home and become a useful member of a community. We must recognize that in order to do this we must guarantee to the worker, through the perfection of the techniques which we as management shall have developed, that we shall learn to understand Mr. Worker in his aptitudes, his skills, his temperament, his interests, his emotional balance, his physical condition; and that we shall place him in that kind of job that will fit the type of skill and type of temperament that is his in such a manner that he shall develop, as a worker, a higher degree of skill, a greater degree of pride, a higher sense of worthwhile living and a greater assurance of continued employment.

I mentioned this to one gentleman and he said, "That seems very intangible and farfetched and very idealistic."

Well, I wonder if it is. We talk now of forms of testing. Shall these methods not continue to develop? We talk of a keener insight into the temperament and emotional structure of the individual by bringing to bear the aid of the industrial physician, and the procedures for testing the physical, emotional, nervous makeup of the worker. We are taking steps in that direction. If our thoughts will only continue to work toward a perfection of these methods—not for discrimination against the worker, but in order to fulfill our obligation to the worker. With this added to our methods of testing, our methods of selection and so forth, may we not build a more accurate job analysis? Surely, from out of the knowledge of the work with its degree of skills required by the job, the complicated mental effort, the hazards, the physical demands, shall we not know more about the kind of man required to fit that job? If we will continue to perfect this effort that we are now making toward a keener and more accurate job analysis, we shall then reach a better job evaluation, or wage level, or wage scale. And out of that, if our job analyses are worth a damn, and are not theoretical, there shall come a definite, mathematical, logarithmic curve by which jobs are rated, and that method of evaluation will parallel the payroll, or should; so that out of job analysis there comes a kind of job evaluation that is based, not upon the whim of some executive or some board, but rather on a definite ratio of quality of the work, the complications of the demands of the job against a mathematical, correct dollar basis for the payroll structure.

Winning Workers' Confidence

Now I submit to you that workers will be responsive if they find that there is a united effort on the part of management in all phases of industry to eliminate the horse-trading, to take the tongue out of the cheek, to end the auctioneering in relation to the worker and to substitute this open, frank, sound job analysis, job evaluation, man-qualification, alongside job alignment, which means that workers are given an opportunity to progress from the simplest to the most complicated task; from the lower earnings to the higher earnings. If, in addition to that, there is a thorough scientific method of testing a definite apprenticeship program that is intended to develop the worker and to fit him for continued training as he goes up from job to job; if there is apparent management's honest interest in the future of the worker, his economic value and social and community value; if management will develop these simple techniques, and we have them together in a platform of what management desires to do for the worker—encourage his continued development in what we might term "industrial democracy"—it seems fair to assume that we can go beyond the conflict on the collective bargaining level into the newest sphere, where management and organized labor recognize that their mutual obligations are to develop an integrated structure, in which the needs of the worker and all that that implies, and the needs of management, back to the stockholders, shall be promoted. Such an integrated structure would be industrial, economic, social; it would make for a working organization that would become a unified thing, united in a common purpose, perpetuating a sound economy, a harmonious social structure and a productive industrial setup as the true expression of the words we use so glibly—"Democracies on the North American Continent."

(*Please turn to page 83*)

The Outlook for Private Enterprise in America[1]

By SUMNER H. SLICHTER

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A RECENT public opinion poll reports that 70 percent of the people believe that after the war we shall have to work harder; 60 percent that pay will be lower; 43 percent that prices will be higher; and 61 percent that there will be a great deal of unemployment. I am not going to take time to put these figures together and ask what they add up to, but I call attention to the fact that it does not make sense to expect lower pay, more unemployment, and higher prices. Lower prices, lower wages and unemployment might be found together, but, barring very extraordinary conditions, not higher prices, lower wages and unemployment.

This poll is significant because it illustrates the indiscriminate pessimism which has been rampant in this country during recent years and which I suspect most people rather enjoy. Indeed, there seems to be a competition in pessimism about the country's economic future, with one person trying to make a blacker forecast than the other. Let me remind you that the man-hour productivity of American industry has been growing rapidly in the last twenty years, and in 1940 was nearly double in non-agricultural industries the man-hour output of 1920. Consequently, any conclusion that the standard of living of this country will be lower after the war than before must assume either a great destruction of capital by the war within the United States or political incapacity on the part of our people to provide conditions favorable to the full use of our resources.

In striking contrast to American pessimism is the sober optimism of the British. The most objective and impressive measure of British optimism is the level of stock prices. This has risen on the London Exchange over 20 percent during the last year, while it has fallen about 15 percent in New York. This contrast is not entirely explained by British liquidation of American holdings. A short time ago I was talking with some Englishmen who had recently come over for a short business trip. I found them eager to get back to England because they found the atmosphere in America too depressing.

[1] Paper presented before the Thirtieth Annual Convention, Investment Bankers Association of America, Chicago, Illinois, December 2, 1941. Reprinted by permission.

The answer to the question "What is the outlook for private enterprise in America?" depends, I think, in the main, upon the success of private enterprise in giving employment. If industry does a good job of providing work and economic opportunity, the government, on the whole, will leave well enough alone and will confine itself to dealing with special situations. On the other hand, if private enterprise does a poor job of giving employment, the government will attempt to do something about it. The result will be that the decision of many industrial policies will be transferred from businessmen and trade unions to the government.

That, I take it, is really what we are thinking about when we ask about the future of private enterprise. It is not that the government is going to take over the hundreds of thousands of concerns upon which we depend for our standard of living. Rather, it is that the crucial decisions of policy will be made, not by businessmen and leaders of labor organizations, but by government commissioners, legislatures, and other public agencies. So, if businessmen wish to retain the policymaking functions, all they have to do is to do a good job of furnishing employment and economic opportunity.

What I propose to discuss, therefore, is whether private enterprise can furnish a job to virtually everyone who wishes to work and who is fit to work.

It has been argued before the Temporary National Economic Committee and elsewhere that private enterprise cannot give sufficient employment because investment opportunities have been permanently curtailed by the settling of the country and by the drop in the rate of population growth. If investment opportunities are not sufficient to absorb the savings of the country, savings pile up as idle deposits. Idle deposits, of course, are not demand for either goods or labor. Hence idle deposits mean idle men.

Undoubtedly the job of maintaining a high level of employment would be considerably easier if the country had more and richer natural resources to develop. Another Mississippi Valley would add greatly to investment opportunities and to the demand for labor—it would be foolish to deny that. It is at least possible that the United States will have the vision to provide itself

with the equivalent of several Mississippi Valleys by taking the lead in encouraging large international movements of goods and capital after the war. Should this happen on a substantial scale, no one would need to worry about investment opportunities for a generation or more.

But even if the United States should fail after the war to provide conditions favorable to large international movements of goods, the country need not lack a sufficiency of investment opportunities. These depend not only upon natural resources but in large measure upon the rate of technological discovery and upon the relationship between costs and prices. The argument that the development of the country prevents a sufficiency of investment opportunities loses much of its force when one notes that older and more developed countries experienced a milder depression and a more complete recovery than did the United States. In 1936, before rearmament had spread outside of Germany, twenty out of twenty-three countries for which the League of Nations compiled production data had a larger industrial production than in 1929. The United Kingdom is not exactly a new country, but in 1936 its industrial production was 15.8 percent above 1929. Greece, another country that is far from new, had an industrial production 39.2 percent above 1929. In Sweden industrial production was 35 percent above 1929; in Hungary, 18.4 percent above; in Finland, 39 percent above; in Denmark, 30 percent above. Only three countries out of twenty-three had failed by 1936 to surpass their industrial production of 1929. The United States was one of these three—in twenty-first place among the twenty-three countries, with industrial production about 7 percent *below* 1929.

Population Rise Not Essential

The increase in population between 1930 and 1940 was little more than half the increase between 1920 and 1930, and the drop may be expected to continue. By 1970 or 1980 the growth of population in the United States may cease. It is argued that the drop in the population growth will produce an insufficiency of investment opportunities. This is an argument that is often misunderstood. Mere growth in numbers of people does not increase demand for goods. Otherwise Puerto Rico would be one of the most prosperous of our possessions instead of suffering dire poverty aggravated by rapid growth of population. The proposition that the drop in population growth will produce unemployment has two parts. One part is that smaller families will increase the volume of saving and thus increase the supply of investment-seeking funds. The other part is that smaller growth of population will diminish the returns on capital by limiting the amount of capital that can be used to provide additional workers with jobs. This would compel a larger proportion of savings to be used to increase the amount of capital per worker.

Whether a smaller growth of population will increase the volume of savings is uncertain. When the number of children is small, larger savings are possible, but most of the money which might be saved may go to give the children a better education. Furthermore, a slower increase of population means that a larger proportion of the population will have ceased to work and will be in the age brackets when savings are consumed rather than accumulated. In 1940, 6.4 percent of the population of the country was 65 years of age or more; by 1980 this is expected to be 16.4 percent. If life expectancy at age 65 increases, this proportion will be still higher. Furthermore, there has been a steady tendency for men to retire at an earlier age and thus live for more years from the income or principal of past savings. All in all, it does not look as if the decline in the rate of population growth were likely to increase the proportion of savings to total income.

(It is interesting to note that despite the drop in the rate of population growth, there has been little change in the number of persons in the population per gainfully employed worker. In 1900, the number of persons per gainfully employed worker was 2.61; in 1919, 2.41; in 1920, 2.54; in 1930, 2.51; and in 1940, 2.50. It is to be noted that gainfully employed workers are not restricted to those actually at work. The so-called gainfully employed include the unemployed—that is, those seeking jobs—as well as those holding jobs.)

More important is the possibility that the drop in the rate of population growth will restrict investment opportunities by limiting the amount of capital which can be used to provide additional workers with jobs. Suppose that $3,000 is required on the average to give the worker the tools and equipment which he needs in modern industry. If the working force is growing by 700,000 per year (as it did during the twenties), about $2.1 billions of savings would be required to provide the increased number of workers with plant and equipment. If the addition to the working force were to drop to 300,000 a year, as it may within a decade, the amount required to provide them with plant and equipment would be only $900 millions. This means that $1.2 bil-

lions of savings would have to find an outlet by increasing the amount of capital per worker or by increasing the amount of housing and other durable goods per person. To that extent a drop in the rate of population growth would limit the outlets for investment funds.

Technological research has been increasing the amount of capital which each worker can advantageously use. In 1929 the amount of capital per worker (in dollars of constant purchasing power) in the United States was almost three times as large as in 1879. Technological change is virtually certain to continue to increase the amount of capital which each worker can advantageously manage, because inventions consist very largely of making machines more automatic and attaching more automatic devices to them. The accumulation of capital is already so large that a very small increase in capital per worker would absorb a large amount of savings.

The National Resources Committee recently estimated that the plant and equipment of American industry (exclusive of land values and government property) was about $120 billions. An increase of a little more than 1 percent in capital per worker would offset the drop in investment opportunities resulting from a decrease in the increment of the working force from 700,000 to 300,000 a year. Consequently, the drop in the rate of population growth would not appear to limit investment opportunity to a serious extent.

(Contrary to popular impression, slower population growth may stimulate rather than diminish the demand for housing. Indeed, the recent housing boom in England has been based in part on the fact that families were smaller. The population of England and Wales increased from 1910 to 1930 at only one-third the rate in the United States and it is now almost stationary. Nevertheless, during the ten years preceding the outbreak of the Second World War, England and Wales constructed virtually as many housing units per thousand families per year as did the United States on the average during the eight years of the building boom of the twenties. Only about one-fourth the British dwellings were constructed with government aid.)

Four Factors Affect Employment

More important than the settlement of the continent and the drop in population growth in affecting the ability of private enterprise to give employment are recent shifts in economic and political power, recent changes in public policy and recent developments in technological research. Four principal conditions determine the amount of employment which private enterprise can give: (1) current relationships between costs and prices; (2) prospective relationships between costs and prices; (3) the willingness of investors and business enterprises to embark upon venturesome undertakings; (4) the rate of technological change.

The first two—current relationships between costs and prices and prospective relationships between costs and prices—may be considered together. Private production, of course, must pay for itself. Some managements are more efficient than others; some plants are more efficient than others; some machines in a plant are more up to date and efficient than others; some workmen are more efficient than others. Consequently, the proportion of plants which can operate at any given time, the rate at which they can afford to operate and the number of men which they can afford to employ, depend upon the relationship between costs and prices. An unfavorable relationship will make it impossible for some high-cost plants to run and for other plants to use certain high-cost equipment, or to employ some of the less efficient workmen. (The precise way in which cost-price relationships limit the scale of operations has not been thoroughly explored by economists. In some cases the limiting factor of production may not be the physical capacity of the plant or the direct operating costs, but the ability of the enterprise to get bank loans for working capital. This latter will depend in part upon the profit record of the enterprise, which will in turn depend upon cost-price relationships.) Likewise, the proportion of new ideas in technological discoveries which appear to be worth exploiting depends upon cost-price relationships. The higher costs rise in relation to prices, the smaller the proportion of new ideas which appear to be worth exploiting.

What Is Trend of Cost-to-Price?

More important than current relationships between costs and prices are expected relationships. It is a striking fact that revival from depression usually starts when costs are high relative to prices. The revival may be started by the necessity of replacing inventories or equipment, or by signs that the relationship between costs and prices is likely to improve. At any rate, as soon as the expectation becomes fairly general that the relationship between prices and costs will improve, revival becomes quite pervasive.

Recovery from the recent depression in the United

States was impeded (1) partly by the difficulties in improving cost-price relationships, and (2) partly by conditions which created unfavorable expectations concerning future cost-price relationships. Many people believed that the country had unemployment and idle plants because there was not enough consumer purchasing power (which was partly true) and that the way to create more consumer purchasing power and to put men to work was to raise wages.

That sounds plausible and many businessmen believed it—at least for a time—and the movement to raise wages under the NRA received support from all parts of the community. Of course, the above reasoning is simply a roundabout way of saying that the way to sell more labor is to charge a higher price for it. There are conditions under which this extraordinary proposition seems to be true, but they do not seem to be conditions which ordinarily prevail. At any rate, between 1933 and 1936 the hourly earnings of factory workers rose 25 percent, and between 1933 and 1937, 40 percent—one of the fastest advances in the history of the country. Prices rose also and efficiency greatly improved, so that a gain in profits accompanied the rise in wages. In 1937, however, with a national income of $71.4 billions, the profits of non-financial corporations were $3.8 billions, in comparison with $5.3 billions in 1923, when the national income was virtually the same as in 1937—$70.0 billions. It is instructive to compare the revival of profits after 1934 with the revival after 1921—two years in which the national income was about $50 billions. Between 1921 and 1923 the rise in the national income of $17.2 billions above a level of $52.8 billions produced a gain of $5.6 billions in the profits of non-financial corporations. Between 1934 and 1937 a slightly larger rise in the national income ($21.1 billions) above $50.3 billions produced a gain of $3 billions in profits. In 1923, with a national income of about $70.0 billions, 61.9 percent of all active non-financial corporations made money; in 1937, with a national income of $71.4 billions, only 41.1 percent of all active non-financial corporations made money.

The importance of the difficulties of converting an increase in business into profits since 1933 must not be exaggerated. On the whole, business did a fairly good job in the face of great difficulties. Far more important was the fact that costs were not under control. The rapid spread of organized labor was producing a major shift in economic power. The growth of organized labor must be regarded as long overdue. It was partly a result of a change in the character of the working force. Between 1890 and the middle of the depression the number of high school graduates increased twenty-five fold. By the early thirties, two out of five children were completing a high school education and most others were obtaining one or two years of it. Educated and thoughtful workmen are likely to expect an opportunity to negotiate the terms of employment with their employers. Interest in labor organization was stimulated by changes in the labor market, particularly by the drop in the resignation rate to less than one-quarter the rate before the First World War. This greatly stimulated the interest of workers in job tenure and hence in unions to protect their job tenure. However successfully business may ultimately adjust itself to the rise of organized labor, managements were naturally hesitant to make long-term commitments while the shift in power was still going on because they did not know how far it would go or what would be its ultimate effect upon costs.

Venture Capital Needed

The third principal determinant of the level of employment is the availability of venture capital. During the period of recovery this was reduced in several important ways. The principal source of venture capital has always been the plowed back earnings of business enterprises. These have been the spearhead of expansion, the prerequisite for drawing in funds from the outside. Although some corporations were able to save, corporations as a whole had no savings in the entire period from 1929 to 1940. Managements were interested in maintaining or restoring dividend rates established in the twenties. Even in 1936 and 1937, when corporations as a whole did fairly well, dividend disbursements exceeded earnings by a billion a year.

Much of the venture capital used in American business has been provided by local capitalists who stood ready to back small local concerns. The depression was hard on these men, and the bank failures in particular diminished both their fortunes and their willingness to take risks. To these restraints on the supply of venture capital must be added the effect of federal fiscal policy. Between 1929 and 1936 the effective rate of the corporate income tax was virtually doubled. The base rate was raised in 1932, consolidated returns were abolished in 1934, intercorporate dividends were taxed in 1935, taxes on undistributed profits were added in 1936. Some changes were particularly well designed to penalize chance-taking. The loss carry-over provision in the corporate income tax was limited to one year in 1932,

abolished in 1933, and not restored until 1938. Capital losses, which had been fully deductible up to 1932, were deductible to only a limited degree throughout the critical period between 1932 and 1938. Drastic changes were also made in individual income tax rates. How severely tax increases reduced returns on investments in equities is indicated by the fact that by 1938 a man with an income of $50,000 a year needed a yield of 8 percent before his tax in order to obtain a return of 5.4 percent. At the same time the capital loss provision of the income tax was modified to narrow greatly the opportunity to deduct capital losses. Can one imagine better arrangements for encouraging investors to avoid venturesome commitments?

The effect of tax changes was magnified by the persistence of a large deficit in the regular budget, undiminished except for one year, in the face of a substantial rise in the national income and of large increases in taxes. When neither rising national income nor rising tax rates reduce the deficit, who could avoid concluding that substantially higher taxes were ahead and that, in view of the record, they might fall in substantial measure upon the return from venture capital?

Technological Change Must Continue

The fourth principal determinant of the ability of private enterprise to give employment is the rate of technological change. Other conditions being equal, the faster the rate of change, the more abundant are investment opportunities and the greater, therefore, the demand for capital goods and for labor. The spread of technological research is one of the bright spots in the economic picture during recent years. During 1940 there were nine times as many men engaged in industrial research in American business as in 1920 and budgets devoted to industrial research were nine times as large as in 1920. The spread of industrial research continued pretty steadily throughout the depression and the recovery. The moderately good record of American business in increasing employment after 1933 in the face of formidable obstacles must be attributed in large measure to the demand for new equipment created by industrial research and the new products developed in research laboratories.

Will Unions Stop Progress?

What are the prospects that private enterprise will be able to do a better job of providing employment in the future than in the immediate past? The answer to this question depends upon what can be done to meet the requirements for a high level of employment—favorable present and prospective relations between costs and prices; willingness on the part of individual capitalists and enterprises to undertake risky ventures; a rapid rate of technological discovery.

Are reasonably satisfactory cost-price relationships and reasonable assurance with respect to future cost-price relationships compatible with a large and powerful labor movement? Or are large and powerful trade unions bound to advance wages too fast for the rate of technological change? The answer depends in the main upon two things: (1) the success of managements in developing an interest among unions in helping to improve products and methods of operation, and (2) the willingness of employers to organize for the purpose of protecting the return on capital.

Many union leaders, especially national leaders, know that the standard of living of workers cannot be raised very far unless the productivity of industry is raised. Even such a modest standard as $1,000 a year for every man, woman and child would require a 50 percent increase in output—a national production of $140 billions. Unionism does not necessarily mean that management cannot make arrangements to discuss problems of safety, production, quality control and training with shop committees, and to obtain from such committees many suggestions for raising plant efficiency. In fact, most unions are glad to select shop committees for that purpose. Satisfactory employer-union relations need to be based upon the understanding by the men of operating and competitive problems of the business which such committees can give.

Rough equality of bargaining power between labor and employers requires in many industries organization by employers. This is especially true in industries where employers are small. It is even true in other industries, because a large automobile manufacturer, for example, cannot afford to be shut down while his competitors take the business. The possibility of maintaining reasonably satisfactory relations between costs and prices, therefore, will depend partly upon the willingness of American employers to organize for the purpose of protecting the return on capital. At the present time there are few organizations among American employers for bargaining with unions and those which exist are nearly all weak, with little money in their treasuries and little authority over their members. The success of collective bargaining in Sweden and the United Kingdom

is partly attributable to the fact that employers have formed powerful national organizations to protect the return on capital.[2]

Incidentally, recognition of unions and attempts to work out friendly relations with them are likely to be cheaper for business than attempts to prevent the spread of unions by granting wage increases—as many enterprises did in 1936 and 1937. Between 1936 and 1937 the hourly earnings of factory workers advanced 12 percent. This increase was not in the main directly produced either by trade unions or by the government. It was largely produced by employers who expected by raising wages to destroy the interest of their employes in labor unions. The effect was the opposite. When the men saw wage increases popping all over the landscape, they said: "There is a lot of easy money around. If we organize we can get more of it." So this attempt to check the spread of organization stimulated it and many an employer who gave one wage increase to prevent his men from organizing was compelled to give another.

What of the Supply of Capital?

The supply of venture capital will depend partly upon the fiscal policies of the government and partly upon the organization of the capital market. The postwar budget is likely to run about $15 billions a year at present prices. The taxes of 1941 would yield this amount on a national income of $100 billions. Given a satisfactory outcome of the war and reasonably favorable public policies, the national income by 1950 (in terms of present prices) ought to be about $120 billions a year and possibly much more. That figure assumes an increase of only 9 percent in the number of people employed and a moderate rate of technological change, with an increase in man-hour productivity of only 25 percent in eight years. Progress is likely to be much faster than that.

All of this is important because it indicates the possibility of substantial reductions in taxes after the war. If business is on friendly terms with organized labor and able to command support from it, unions and business should be able to persuade Congress to make tax changes which are well designed to encourage enterprise and to raise the demand for labor. A reduction in the tax on that part of corporate profits spent for new plant and equipment (the reverse of the undistributed profits tax) would help restore the practice of plowing back earnings—so necessary if new concerns are to grow readily and furnish stiff competition to established firms. The loss carry-over provisions of the corporate income tax could be modified to facilitate the accumulation of capital by new concerns as well as to reduce the risk of loss by all concerns. A more flexible treatment of depreciation allowances would also reduce the risk of loss. Enterprises might be encouraged to write off half the cost of new assets during the first three or four years of their life. This would increase the subsequent tax liability of the concern, but it would reduce the chance that the enterprise might pay taxes for several years on a venture which eventually turned out to be a failure.

It may not make political sense to talk about sweeping reductions in surtax rates. But surtaxes in recent years have been so severe as to prevent recipients of large incomes from considering the type of investment where the possibility of large capital losses is offset by the possibility of large gains. Thus, there is conflict between the interest of the community in a more even distribution of wealth and its interest in full employment. This conflict might be compromised by large reductions in surtaxes on that part of income invested in non-refunding equities.

All of these possible reforms in the tax system acquire added importance when account is taken of the contagious effect of an investment by one enterprise upon investment by its rivals. A store which modernizes its windows and counters, a railroad which purchases streamlined equipment, a manufacturer who introduces a new process, all provoke similar action by their rivals. Hence it is important that tax laws be designed to give every encouragement to the enterprise which is willing to put money into an innovation or an experiment, and particularly to the concern which is willing to step out ahead of its rivals and to make commitments in anticipation of better business.

The amount of capital which goes to work each year as venture capital is not fixed or predetermined. Both investment opportunity and funds for risky ventures have to be discovered. Consequently, the volume of investment depends upon the efficiency of the personnel and the machinery for discovering good risks and for finding persons who might be persuaded to buy particular types of securities. One of the legacies of the war in this country is likely to be a tax system which drains away most of the income of those people who are best able to take risks. Hence, risk capital must come to an

[2] An illuminating discussion of Sweden's experience with collective bargaining will be found in Norgren, Paul H., *The Swedish Collective Bargaining System*, Harvard University Press, Cambridge, Massachusetts, 1941.

increasing extent from persons with moderate incomes. Since such persons need to diversify their risks, the provision of risk capital may require the development of a new type of investment trust. Instead of investing in the Dow-Jones averages the trust would seek to supply capital to promising new or young concerns. Its stock in trade would be its ability to investigate the prospects of new concerns. Its capital would turn over roughly every five to ten years, because, as enterprises became seasoned, the trust would sell out in order to release its funds for new opportunities. Possibly the form of investment trust outlined may not be the best way to meet the need for new sources of venture capital. Nevertheless, one must expect the organization of the capital market to change constantly as conditions change and for new kinds of organizations to develop as a result of the altered distribution of income and severe taxes on large incomes.

Research in Infancy

The brightest hope for private enterprise is provided by the prospect that technological research will continue to expand rapidly. Despite the fact that nine times as many persons are engaged in industrial research today as in 1920, such research must still be regarded as in its infancy. Half of all industrial research is done by four industries—chemicals, petroleum, electric apparatus and electric communications. Although there are over 9,000 enterprises in industries covered by the Old Age Pension Act which have 300 or more workers, only about 2,500 concerns have industrial research laboratories. Effective arrangements for bringing industrial research within the reach of small enterprises remain to be made.

Relatively few concerns have special departments for studying the possibilities of new products and for developing new products. Business is apparently on the eve of developments of first importance in the systematic search for new products and the improvement of old products. One of the most valuable features of our economy is that it consists of about three million enterprises outside of agriculture. This means that there are three million places where budgets are made, three million places where experiments may be authorized and innovations attempted. Such an economy has a capacity to experiment and to make innovations far surpassing any form of regimented economy. It has a dynamic drive and a capacity to make discoveries which no regimented economy can hope to match.

Until recently investment opportunities have been sufficiently abundant so that the capacity of the economy to produce innovations has been taken for granted. Nothing in particular has been done to increase the output of innovations. Consequently, the advantages of the wide dispersion of initiative which is characteristic of our economy have been only inadequately realized. In the future conditions will be different. It will not be possible to take the output of innovations for granted. Special steps will be needed to assure the development of a large number of new or improved products and a large number of changes in production methods.

End of War Will Bring Test

The big test of private enterprise will be provided by the shift from war production to peacetime production. Many people believe that the end of the war will be promptly followed by a great collapse. This will probably not happen—at least not immediately. Experience after previous wars indicates that the first phase of the postwar adjustment (or maladjustment) is a boom. The boom is based upon shortages which accumulate in the course of the war. In 1918 more than one-fourth of the national product was represented by war expenditures. The armistice, however, was not followed by a collapse, but by further expansion, which continued until February and March of 1920.

The longer the present war continues and the larger the war production, the greater will be the shortages. Automobiles, refrigerators, radios, vacuum cleaners, washing machines, lawn mowers, and a wide variety of durable consumers goods will be available during the war in only small quantities. Non-defense housing will be severely curtailed. Railroads will not be able to replace passenger equipment. Non-defense industries will not be able to buy new machines. Even a wide variety of non-durable goods, such as articles of apparel, will become scarce if the facilities of ocean transportation are inadequate, as they are likely to be.

War Shortages Build Backlog

One cannot pretend to make an accurate estimate of the probable volume of the accumulated shortages. Nevertheless, if consumers in 1942 should be able to buy half the usual amount of durable consumers goods (an optimistic assumption), and if non-defense industries are able to buy half their usual amounts of industrial equipment (an even more optimistic assumption), the accumulated shortages by the end of 1942 would be

about $10 billions. Should the war last through 1943, the accumulated shortages would be much greater—$25 billions or even $30 billions. Such a backlog of accumulated civilian demand would make any public works program that has been suggested look small. Furthermore, this backlog would consist of goods that people are eager to own.

When the resistance of the enemy is broken (even before the formal terms of peace are reached), the patriotic urge to buy defense bonds will weaken. People will be eager to convert part of their income into automobiles, radios, and many things which they have been going without. In fact, many people will redeem part of their bonds in order to make postponed purchases. If the rush to make postponed purchases is so great that industry cannot supply the goods, prices will rise and there will ensue a postwar boom which will eventually end in collapse.

Both a postwar boom and an ensuing collapse as a result of the boom are unnecessary. True, it will require careful management and careful timing to prevent a boom and the results will not be perfect. Several steps will be needed. It will be necessary for the government promptly to cut its expenditures (by releasing men from the service and permitting slower delivery of government orders) as bond sales fall and private expenditures rise. It also will be necessary for the government to make changes in the order of priorities on raw materials and to increase the quantities of raw materials for non-defense production. It may be necessary for the government to limit the volume of bond redemptions per month. In those cases where the transfer of workers from defense to non-defense work requires a change of employer, efficient service from the public employment offices will be needed. It will be necessary for many thousands of private plants to be prepared to start or to expand non-defense production as soon as possible after fighting ceases. This will be one of the most difficult jobs of all, because in many cases retooling and shifting of machinery and equipment will be necessary. In fact, demand for automobiles and other articles may develop faster than industry will be able to supply it. Probably it will be necessary to "de-ration" various articles, such as automobiles, refrigerators, and radios, by gradual steps—that is, to permit the purchase of them by successively broader categories of persons before restoring free markets. Adequate arrangements to finance the transition may require that many business enterprises reduce dividends during the war period.

Proposals for paying dismissal wages or unemployment compensation to workers dropped from defense plants should take account of the probability that in the vast majority of cases the period of unemployment will be short. Nevertheless, if the government undertakes to cut expenditures promptly as bond sales fall off or as bond redemption starts, some people will be dropped from defense plants who cannot be immediately put to work in non-defense plants.

Even though the co-ordination and timing of the various steps necessary to prevent a postwar boom may not be perfect, with the result that a moderate boom occurs with the inevitable collapse, this collapse need not be prolonged. Furthermore, if postwar inventory speculation is prevented, it need not be severe. It will be recalled that the collapse of 1921, though severe, was short. Retail trade seems to have dropped only about 8 percent. Residential building did not drop at all. The country came out of World War I with the best reserve against unemployment that it has ever had, because millions of persons had purchased large amounts of Liberty Bonds. The liquidation of these bonds supported markets right through the brief depression, as the steadiness of building construction plainly shows. Of course, the depression of 1921 would have been much less severe if the 13 percent rise in wholesale prices between 1919 and 1920 had been prevented.

After the large amount of accumulated demand has been satisfied, private enterprise will meet its second big test—the task of providing a sufficient number of improved and more attractive products to keep 55 million men at work. Here the fact that the non-agricultural part of American business consists of over three million enterprises will prove important. From three million centers of innovation will come many millions of ideas for new products and methods, for improvement in old products and methods, and for improvements in many forms of services. Of the greatest importance also will be the expansion of industrial research. In fact, technological research is now conducted on a scale so much larger than after the last war, or after any previous wars, that it must be regarded as an important new instrument of postwar adjustment—an instrument that was scarcely available in the history of war.

Other wars have contributed in important ways to technological progress, but this war will do so far more than any previous one. Air transportation, rapidly growing and improving before the war, is receiving an enormous impetus from the war. Fast stratosphere planes using superchargers will annihilate distance and will change business and vacation habits. The indirect

effects upon investment opportunities are likely to be profound. The war will produce at least a five fold increase in the aluminum capacity of the country and possibly more. Aluminum will be available at roughly 13 cents a pound—or its equivalent in terms of the postwar price level. Consider the obsolescence that can be created with 13-cent aluminum. Every automobile will be obsolete. A large part of railroad equipment will be obsolete. (It would probably be advisable for the railroads to obtain immediate permission from the Interstate Commerce Commission to write off passenger equipment faster than they are now doing. Obviously, part of the money which they now call "net earnings" consists of unadmitted obsolescence.) Important changes in the design of trucks will be made. The competition of aluminum will force the redesign of much equipment which is not now made of aluminum.

Housing Biggest Opportunity

The biggest opportunity for private enterprise to increase the volume of employment is in the development of attractive and cheap housing. The end of the war will see a substantial accumulation of the demand for housing—at any rate, in case the war lasts through 1943. This demand will be reinforced (1) by the deficiency in housing construction which lasted throughout nearly all of the thirties, and (2) by the shifts of population which will be produced by the war. More important than the backlog of demand created by recent events is the potential market which can be created by obsolescence. Of the twenty-five million houses in the United States, about one-quarter were built before 1900, and another quarter are over twenty-five years old. Houses can be produced today for $3,500 or $4,000 which make one-third or more of present houses seem drab, dreary and inconvenient. Many additional improvements are possible. Furthermore, a house can be sold for $3,500 or $4,000 on annual payments and carrying charges which are no more than those on an automobile costing $700. If modern technology can solve the problem of cheap and attractive housing, the problem of employment will be pretty largely solved in America for at least a generation.

The thesis of these remarks has been that the prospect of private enterprise depends upon the kind of economic future which it succeeds in offering America. Arguments about the relative merits of different types of economic organization will not count. The decision will be made by performance. If the performance of private enterprise is good, if, despite obstacles, it provides a high level of employment at good wages and the prospect for still higher wages, if it makes labor feel that it is a part of industry and that it has a good chance to get its ideas on any subject considered, if it offers consumers a wide variety of attractive goods at attractive prices, industry will continue in the main to be based upon the principle of private initiative and enterprise.

This survey points to the conclusion that the outlook for private enterprise is neither dark nor rosy. The depression greatly weakened the confidence of the man in the street in the ability of business to give him prosperity. It provoked legislation, particularly in the form of taxes, which placed heavy burdens upon daring and innovation. Nevertheless, private enterprise must be conceded a good chance, probably a better than even chance, of retaining the responsibility for decisions of policy over most of the area where policies are today privately made. Of course, these decisions in some instances will be made jointly by managements and unions through collective bargaining.

Future Not Too Dark

Certainly, the future of private enterprise cannot be regarded too pessimistically so long as it is increasing its capacity to improve products and methods as rapidly as it has done in the last twenty years, and so long as it possesses far greater capacity to discover improvements in products and processes than any form of the economy which involves centralization rather than dispersion of initiative. At the same time, the obstacles confronting private enterprise are great. It still has much to learn about dealing with organized labor and enlisting the help of union committees in shop operations. It cannot wait for legislative obstacles to daring and enterprise to be removed. It must do a good job of giving employment—a much better job than it did in the thirties—in the face of tax laws which are almost unbelievably burdensome upon the innovator and the experimenter. Only after business has won back public confidence by making good in the face of obstacles will it be possible to get much legislative relief. The businessman of the twentieth century, however, may take comfort in the fact that his predecessors of the seventeenth and eighteenth centuries laid the foundations of modern capitalism in the face of even greater obstacles.

No one need be surprised if many able executives prove unsuited for the task ahead. A rough analogy

may be drawn between the situation of the leaders of business and the situation of the British and French generals early in the war. Planes and tanks changed the rules of war so drastically that some officers who had mastered the old rules could not learn the new ones. Likewise, the rise of labor and the expansion of public policy have changed the rules of business so drastically that the very mastery of old rules easily becomes a handicap in learning new ones. New conditions require not only changes in business policies, but also changes, at least in many instances, in the type of top executive—a change to men who are in closer touch with the community and with their employes and who confine their associations less exclusively to other top executives. Consequently, the success of private enterprise in adjusting itself to new conditions and in retaining a wide area for private policymaking will depend upon whether top managers change their ways or whether enterprises change their top managers.

It would be tragic and ironical if the community were to lose the form of economic organization which is best suited for permitting a wide dispersion of initiative and a broad practice of experimentation and innovation at the very time that the resources of research are becoming available to industry in unprecedented amounts. The promise of technological research may slip through our grasp; it may be lost through the excessive centralization of the policymaking in government; it may be lost in the struggle of pressure groups which throttle initiative in order to protect various markets. If the promise of modern technology can be captured, however, no one can doubt that we are on the threshold of great progress and that we shall be able to create a standard of living such as the world has never seen.

POSTWAR PLANNING[1]

The management of your company believes that through widespread and intelligent planning by industry, with the co-operation of labor and government, ways and means should be found of lessening the violence of fluctuations in business activity, thus softening the impact of depressions, stabilizing employment and helping maintain high standards of living.

To these ends a Special Planning Committee was appointed during the past year for the purpose of co-ordinating the efforts of your company's management groups to become prepared to resume regular commercial activities promptly at the conclusion of the war. It is hoped that by developing new materials, new products and better methods, and by improving and broadening the established lines of business, a definite program may be formulated which will permit the full utilization of facilities and man-power in supplying the demand for those electrical goods and services which contribute so importantly to the American way of living. This committee has carried on, and will continue, such long-range planning activities, but only to the extent that they do not interfere with the full discharge of your company's responsibilities in the present emergency.

[1] From the Fiftieth Annual Report, General Electric Company, 1941.

Mending Our Weakest Links

By McGREGOR SMITH

President and General Manager, Florida Power & Light Company

TO TAKE corrective measures for the alleviation of strong employe dissatisfaction, we must know where it exists and what its causes are. Too many managements have said, "Our door is always open to any employe seeking redress of a grievance" and have done nothing further. Have many employes ever darkened the door of the head office? No. Few have done it. Why? Because they have been afraid to do so. If they went to the top boss with their problems how would their foreman or supervisor feel? He would probably not like it at all and he might hold it against them. And besides, the employes are afraid that the top boss might regard them as chronic kickers. Industrial history is full of cases of management unaware of serious employe dissatisfaction until this dissatisfaction had exceeded the boiling point.

If top management really wants to know how the employes think and feel, it must take more active measures than merely proclaiming the policy of the "open door." It must make it: (1) *safe* and (2) *easy* for the employes to express themselves. In 1940 our company engineered a project in our largest metropolitan area which met these two requirements.

All employes and executives in this area were brought together in groups as large as the facilities and the operating requirements would permit. A major executive addressed each group covering the eight following points:

1. Periodically we take an inventory of the equipment of the company. Today you are being asked to co-operate in an "Inventory of Ideas" [1] which will add to the efficiency of our organization and the happiness of the people in it.

2. This inventory is not an entirely new plan but a progressive, systematic and thorough adaptation of methods we have always used.

3. No person should put his name or his handwriting on his questionnaire and thus allow the possibility of the questionnaire being identified. Moreover, the management pledges that no effort will ever be made to find out "who answered which" questionnaire. Every person is urged to answer the questionnaire *frankly*.

4. The chairs for each group meeting were arranged as far as possible with two feet between side-by-side chairs so that no person could see how the next person answered his questionnaire.

5. Each question in the questionnaire is followed by five answers expressing different degrees of satisfaction or dissatisfaction. Each person checked the one answer to each question which expressed his feeling on that question. The last page is blank and on it the person *printed* (to avoid identifiable handwriting) any additional comments.

6. On the front page the person indicated his department (or in case his department was small, the group of departments to which he belonged, according to a pre-arranged plan). This made it possible to analyze the results finely enough to use them for remedial purposes but not so finely as to reveal the identities of individual people.

7. A special employe committee of a dozen members was announced, which was to sort the questionnaires by departments. Any others who wished might join this committee.

8. The analysis of the questionnaires was to be made by a disinterested person from outside the company who is experienced in this kind of work and serves as a sort of auditor. This special committee was to handle the questionnaires by departmental groups and turn them over to this special auditor. He was to take them to New York City, tabulate the results, and destroy the original questionnaires.

This eight-point explanation to each group serves a dual purpose. It gives management a perfect occasion for showing its interest in the employes, their problems and suggestions; and it makes the event a matter of major importance, as it should be.

This talk by management is a simple one. It takes only five or ten minutes. Then the questionnaires are distributed, and after receiving certain technical instructions from the "auditor" the employes proceed to check their answers.

There were thirty-two questions and most of the people took twenty to forty minutes to check off their answers. We could have had more questions but we felt

[1] Copyrighted.

that these thirty-two gave a very good coverage to our personnel and management problems. After checking off his answers to the questions, the printing of the voluntary comments on the blank last page took anywhere from five minutes to a half hour. A few individuals who were not skillful with the pencil and who wanted to express themselves at length took an even longer time. Each group in our Miami organization took this survey with an attitude of deepest interest. The following voluntary comments taken from the back page of two of the questionnaires typified the attitude of the employes toward this project:

> I am very proud of my job and my company. By comparison with other business with which I have come in contact, it stands shoulder high above in squareness, honesty of dealing, quality of service and type and character of its employes from the top down. This questionnaire is just another example of our management's constant endeavor to know and to improve conditions of employment.
>
> My company officials as a whole are always anxious to solve the problems of their employes but sometimes wait until it is too late. I believe this survey will assist materially.

When an employe had filled out his questionnaire he dropped it through a slot into a large sealed (nailed-up) box. Every seventy-five minutes another group meeting was held so that this survey of the entire organization was completed very quickly. Each group included both employes and executives. When the employes saw major executives in the same group with themselves, it produced a very good reaction. And the major executives were not mere "window dressing." They took to this survey just as heartily as did the rank and file.

After the last group had answered the questionnaire and had left, the special employe committee opened the big "ballot box" into which all the questionnaires had been dropped. The questionnaires were sorted by departments, tied into bundles and taken to the express office for shipment to New York City. In the process of sorting, the committee could see for itself that the questionnaires could not be identified.

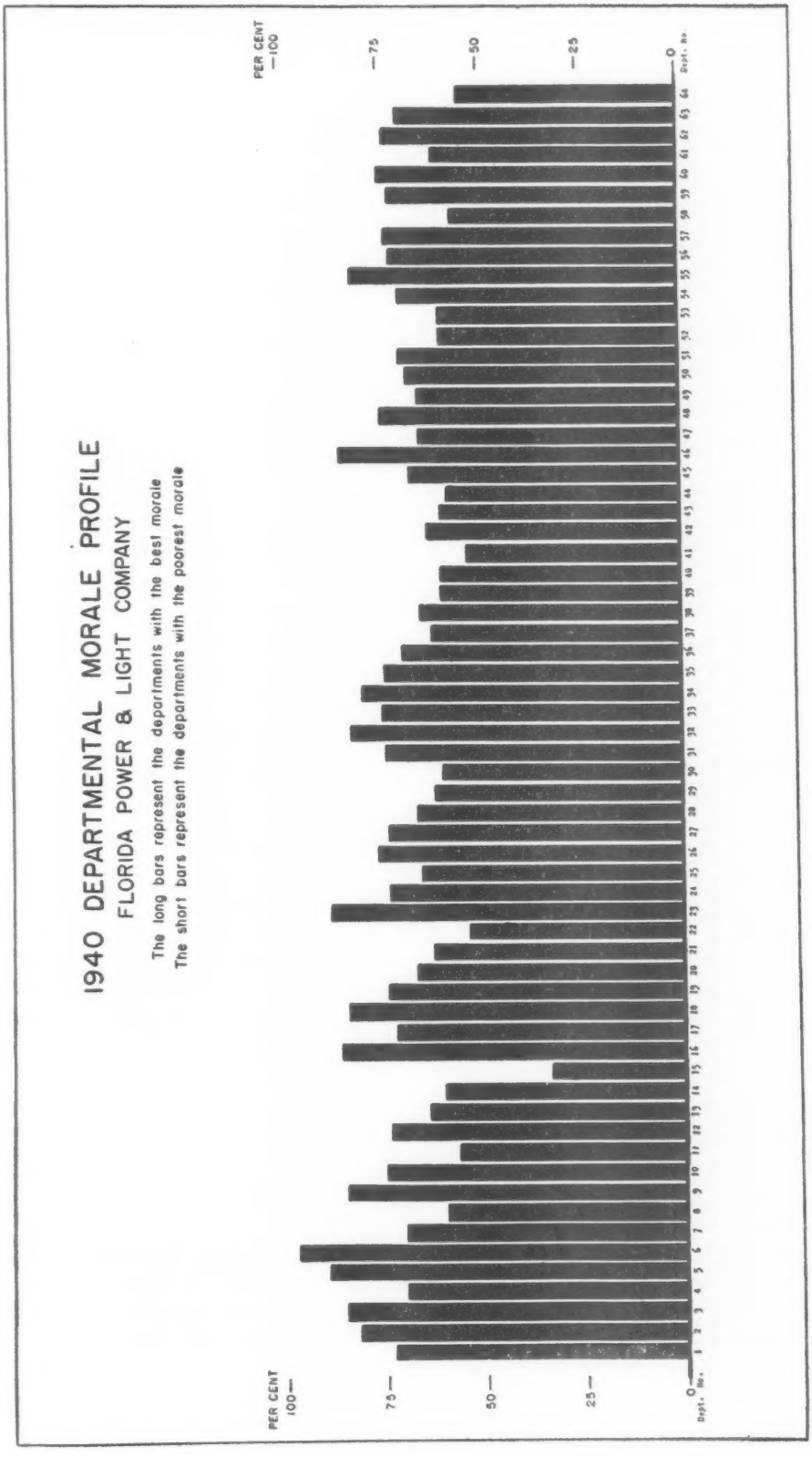
In New York City all information on the questionnaires was organized into usable form, and the questionnaires themselves were destroyed in keeping with our pledge to the employes. On the next page is a chart entitled "1940 Departmental Morale Profile" which shows graphically how much the morale in our company varied from department to department. Each bar in this chart represents a particular department. A long bar represents a department with high morale and a short bar stands for a department with relatively lower morale. The longest bar is the sixth one in the chart. Out of the largest possible score of 100 points, this department has 96.7. It is hardly likely that any department with so high a score can become the center of a serious problem in employe relations, and it is hardly likely that such a department is hampered in efficiency by low morale.

The shortest bar is the fifteenth one. This department has a score of only 33.3. Fortunately, it is a very small department; if it were large, it would be a decidedly serious problem. No other department has nearly so low morale; no other department falls below 50. Only six other departments fall below 60.; this is fortunate, since, for purposes of stability in employe relations, it is far better to have all departments moderately satisfied than to have a goodly number extremely well satisfied and to have an equal number extremely dissatisfied.

At first glance one might assume that this chart portrays a marked unevenness of morale from department to department. In terms of the ideal situation, there is an undesirable degree of unevenness, but in terms of the general run of things we have reliable evidence that this chart is unusually *even* rather than *uneven;* most concerns have much more variation. Of course, our company is not satisfied to be better than most. No company can afford merely to be better than others. Our company and every other company will profit by putting forth every reasonable effort to have in every department as high morale as possible.

Did this survey bring surprises to our company? Certainly. Our management had tried to be just to every employe of every department. It had adopted personnel policies which it regarded as fair and enlightened. It had tried to select department heads and foremen who would be good leaders and efficient. And because of such measures taken, it did not expect any department to fall below 60.

We found that the chief cause of the unevenness of morale, departmentally, lay in the variance of the leadership ability of our department heads and foremen. The survey results indicated this conclusively. Of course, we had had no way up to the time of the survey to make an intelligent appraisal of the leadership influence exercised by our departmental executives, and unless such appraisals are made, extreme variations are bound to develop. We had been aware of the leadership deficiencies of some of our executive staff, but we were not fully aware of the effects upon our employes that such


1940 DEPARTMENTAL MORALE PROFILE
FLORIDA POWER & LIGHT COMPANY
The long bars represent the departments with the best morale
The short bars represent the departments with the poorest morale
PER CENT
100
75
50
25
0
Dept. No.

deficiencies had produced. It seems that such conditions have to be brought out in clear relief in order to galvanize a management into remedial action, and this survey rendered just such a service to us.

In our survey there was a company average for each of the thirty-two questions. These averages showed the relative strength and weaknesses for the organization as a whole. For each department there was a column of figures showing how it compared with the company averages. For example, in Department X on the first question "Efficiency of Equipment," the answers showed 7.5 points less satisfaction than the company average for that question; so this difference of 7.5 was put in red in the column for Department X. On the second question "Efficiency of Planning" the average for Department X was 3.4 points above the company average; so the difference of 3.4 was put in black. There were thirty-two figures in this column, some red and some black for Department X. A chart of this column of figures is also shown, "1940 Morale Profile of a Single Department." This chart shows definitely that the morale problems of this department are not wages, although many people blandly assume that money tells the whole story of employe morale. Questions 23, 24, and 25 have to do with wages and the results are all "in the black," that is above the corresponding company averages by the amounts of 10.6, 12.6, and 6.5 respectively. The largest deficiency (red figure) is on Question 18, "Criticism in Public." The figure is a 18.2 below the company average. This item is purely one of leadership. Everyone knows that being criticised in the presence of others is galling to anyone and yet this principle has evidently been violated flagrantly in this department.

The second largest red figure is 13.2 on Question 13, "Consideration and Courtesy" shown to subordinates. Those items which are starred are the ones which are most subject to the leadership of the immediate superior and it is on these starred questions that the majority of the figures of this department are red. Thus, it is shown that the responsibility for the under-average morale of this department rests upon the department head. Given these figures, the department head will have accurate guidance in his efforts to bring about improvement.

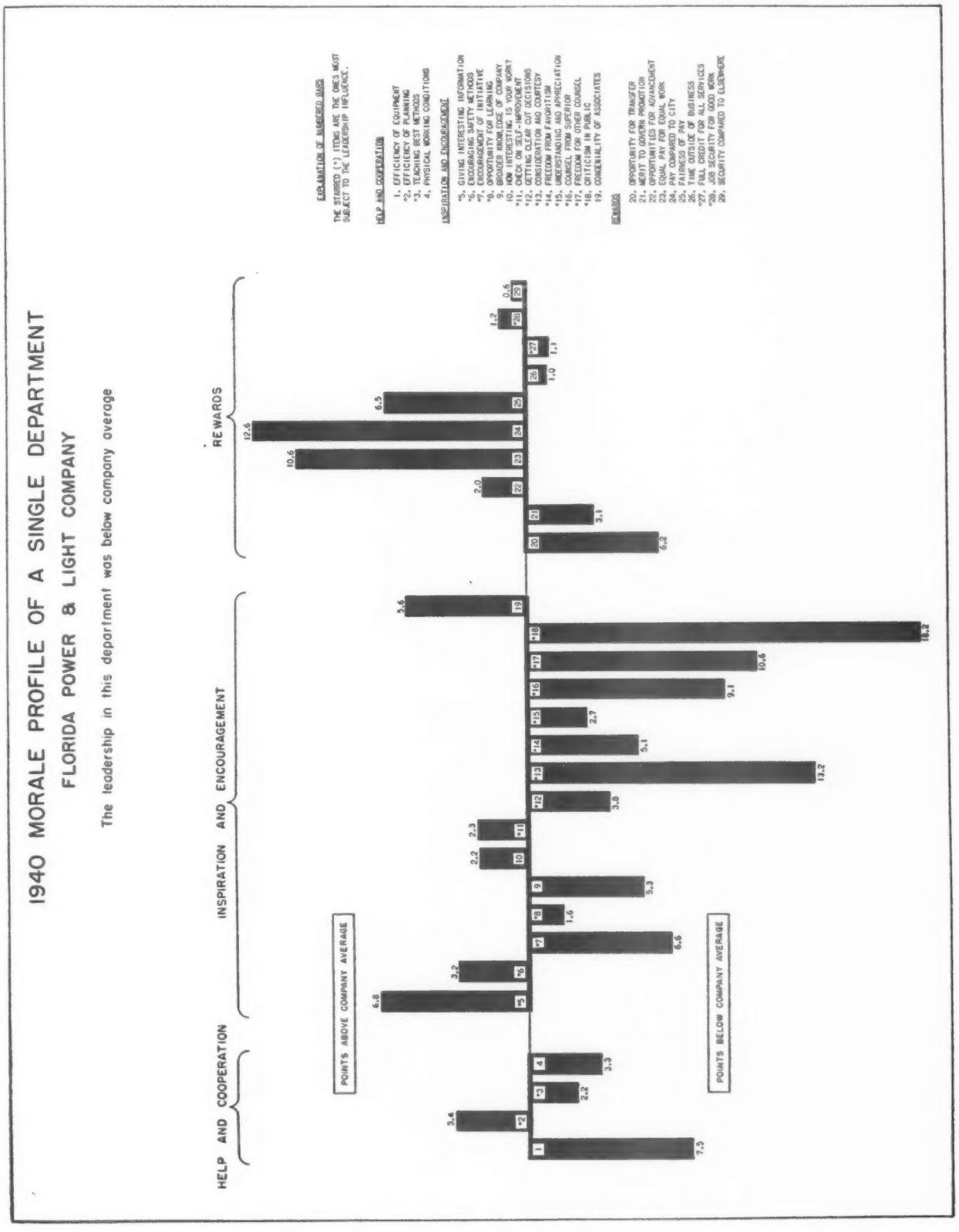
In the master report of the survey there is a column of red and black figures for every department and for every division. All weaknesses stand out plainly for they are in red. It is possible to run the eye down a column and see readily how that department stands on each question. And it is possible to trace a single question through all departments and thus to find where the indicated problems are handled well and where they are not. Every management wants its facts readily available. This report represented its data in such a way as to meet that requirement.

Too many reports with really useful facts do not get beyond the desks of management. This is not entirely the fault of management, for management is diverted by the new problems which are constantly occurring. We tried to organize our survey results so that they could be allocated to all the people who could use them constructively. Each column of red-and-black figures was entered on a separate and self-explanatory "balance sheet" so that there were as many of these special balance sheets are there were department heads in our company. Any of these executives could look at his balance sheet and know how the figures for his subordinates compared with the corresponding company averages; in other words, whether their morale was higher or lower than the morale of the company as a whole. However, his balance sheet would not tell him anything about departments not under his supervision. In matters of employe morale, it is advisable to keep the facts as confidental as is consistent with availability for constructive use.

These special balance sheets were issued to all department heads at a meeting called for that purpose. First I explained the meaning of red figures in contradistinction to black ones and then I touched upon the following points:

1. It is natural for every executive to expect a balance sheet which is entirely or at least almost entirely black. Since these balance sheets are based upon comparisons with the company averages, in the aggregate there must be as many red figures as black ones in this first survey. It happens that every balance sheet in this particular survey has at least one red figure and at least one black figure, although it would be possible for a balance sheet to be all red or all black. The red figures on a balance sheet do not *prove* that the department head is at fault, but it will be his fault if he does not hereafter give those particular items his special attention.

2. Half of the items on the balance sheet are starred (for example "Efficiency of Planning"), indicating that those items are especially subject to the leadership influence of the department head. Any executive by the application of thought and thoughtfulness can bring about improvement on the sixteen starred items without the aid of material expenditure, and any improvement


1940 MORALE PROFILE OF A SINGLE DEPARTMENT
FLORIDA POWER & LIGHT COMPANY
The leadership in this department was below company average
HELP AND COOPERATION
INSPIRATION AND ENCOURAGEMENT
REWARDS
POINTS ABOVE COMPANY AVERAGE
POINTS BELOW COMPANY AVERAGE
EXPLANATION OF SUGGESTED BARS
THE STARRED (*) ITEMS ARE THE ONES MOST SUBJECT TO THE LEADERSHIP INFLUENCE.
HELP AND COOPERATION
1. EFFICIENCY OF EQUIPMENT
*2. EFFICIENCY OF PLANNING
*3. TEACHING BEST METHODS
4. PHYSICAL WORKING CONDITIONS
INSPIRATION AND ENCOURAGEMENT
*5. GIVING INTERESTING INFORMATION
*6. ENCOURAGING SAFETY METHODS
*7. ENCOURAGEMENT OF INITIATIVE
*8. OPPORTUNITY FOR LEARNING
9. BROADER KNOWLEDGE OF COMPANY
10. HOW INTERESTING IS YOUR WORK?
*11. CHECK ON SELF-IMPROVEMENT
*12. ATTENTION TO SUGGESTIONS
*13. CONSIDERATION AND COURTESY
*14. FREEDOM FROM FAVORITISM
*15. UNDERSTANDING AND APPRECIATION
*16. COUNSEL FROM SUPERIOR
*17. FREEDOM FOR OTHER COUNSEL
*18. CRITICISM IN PUBLIC
19. CONFIDENTIALITY OF ASSOCIATES
REWARDS
20. OPPORTUNITY FOR TRANSFER
21. MERIT TO GOVERN PROMOTION
22. OPPORTUNITIES FOR ADVANCEMENT
23. EQUAL PAY FOR EQUAL WORK
24. PAY COMPARED TO CITY
25. FAIRNESS OF PAY
26. TIME OUTSIDE OF BUSINESS
*27. FULL COST FOR ALL SERVICES
*28. JOB SECURITY FOR GOOD WORK
29. SECURITY COMPARED TO ELSEWHERE
1 7.5
*2 3.4
*3 2.2
4 3.3
*5 6.8
*6 3.2
7 6.6
*8 1.6
9 5.3
10 2.2
*11 2.3
*12 3.8
*13 13.2
*14 5.1
*15 2.7
*16 9.1
*17 10.6
*18 18.2
19 3.6
20 6.2
21 3.1
23 2.0
24 12.6
25 10.6
26 6.5
*27 1.0
28 1.1
29 1.2
0.6

in these starred items will carry over in some degree to the other items.

3. In all likelihood, we shall, after a reasonable period, have another survey which will show how much improvement has been made in each department. This management considers good morale essential in every department and asks each department head to bring about improvement, especially on any points which are now "in the red."

4. No department head should reveal his balance sheet figures to anyone, except his assistant department head. He should feel free to go to his superior for counsel and assistance.

5. A series of meetings for round-table discussions of leadership problems will be held and each executive will be scheduled to attend one of these meetings. Such discussions will be beneficial in developing methods for improving morale in our company.

Then this special meeting was dismissed and the balance sheets were issued. There is good reason to believe that the red figures provided rude shocks to some executives who had previously given too much lip service to their leadership duties. But, after all, the most beneficial medicine is not always pleasant to take.

At the time the morale questionnaires were answered by all employes and executives, an additional questionnaire on leadership problems was issued to all the executive and supervisory staff. This leadership questionnaire was to be taken away, studied, answered and returned duly signed. There were seventy-four questions covering practically all phases of the art of handling men. Some of the questions were highly controversial; all were provocative of thought, and that was one of the main reasons we used this type of questionnaire. Each question was followed by two to five answers, one of which was to be checked.

The first day this leadership questionnaire was issued, informal debates broke out at the luncheon table, in the washrooms, everywhere. One executive would say, "On question 18, I gave the first answer—Morning." And the reply would likely be, "Oh, you're wrong on that one. The best time of day to give a serious criticism is at the end of the day. Here's my reason. Etc., etc." If this questionnaire had not done anything other than to arouse these impromptu debates, it would have been very much worth while. But, of course, there were additional benefits from it.

When all these leadership questionnaires had been turned in, we shipped them away to be analyzed. It was found there was only one question in the entire list of seventy-four on which there was complete agreement. We wanted to know the best answer to each question, and we were not satisfied to accept a majority answer as necessarily the correct one. So we turned over to the analyst the ratings by management on the leadership ability of the individuals who answered the questionnaire. He correlated the answers these individuals checked with the leadership ability of those individuals as rated. In this way he was able to determine how our best leaders think on the leadership problems we had given them. He found that our best leaders followed essentially the same trend of thought as the best leaders in all other sections of the country. And, of course, the trend of thought of our own best leaders, checked against the trends of best leaders in other parts of the country gave us a valuable set of standards for use by our own executives, both present and future.

Each round-table group at which the answers to the leadership questionnaire were discussed consisted of a couple dozen executives. To each executive was given back "for keeps" the questionnaire he had previously answered. Each question was taken up in turn, the percentages favoring each answer were given, the answer favored by the best leaders was indicated, and the reasons for the answers chosen were discussed freely. These discussions were interesting in the extreme. The participants could not help gaining better ideas on leadership.

At each discussion meeting, notes of the discussion were taken. After the last meeting had been held, the notes from all the meetings were organized into a book on leadership methods. A copy of this book was sent to every executive who had participated in the discussion meetings so that he could suggest changes and additions; in other words, so that he could help edit the preliminary edition of the book. When these copies of the first edition of the book were returned with suggestions, the final edition was compiled. Thus, in fact, all of our executives were the authors of our book, *Important Problems in Leadership*. A copy of the final edition of our book was presented to each executive bearing his name as the co-author.

In this way we were able to evolve leadership methods which are effective, which are thoroughly understood, and which are a source of constant reference by all of us.

Talleyrand said, "There is something wiser than anyone; and that is everyone." In our survey and leadership development program we have found this to be true. Many, many people in our organization contrib-

uted ideas in this inventory which we have already put to good use. I could enumerate any number of changes we have already made to improve morale or efficiency, or both; but the chief improvement we are making lies in the leadership methods of our executive staff, for the happiness of the man-on-the-job depends largely upon the sympathetic and understanding handling by his immediate superior. Leadership is an art which can be learned. Lest someone might consider our leadership development program as too idealistic, I should like to cite the views of two hardheaded businessmen of the past generation. That shrewd Scotsman, Andrew Carnegie, paid a fabulous salary (reported to have been $1,000,000 annually) to Charles Schwab because the latter had made himself a master of the art of handling men and as a consequence was able to increase the output of steel. Another practical and even more successful man was the elder John D. Rockefeller, who said leadership ability was more valuable than any other and he would pay more for it.

The Anomaly of Functional Authority at the Top

(*Continued from page 54*)

knowledge and experience to bear on line work through other means, without upsetting the principles of unity of command, of individual accountability, and of co-ordination of effort.

There can be no question that Taylor made supremely important contributions to modern organization; I believe it is clear that his development of functional foremanship in the *bottom* level of command is one of those contributions. I believe it is equally clear, however, that an attempt to introduce functional authority at the top has nothing to offer in assisting to find the answers to the tremendous problems with which we are faced. It is in line with much experience that such an attempt makes only more difficult the role of administrator. It is a perversion of sound principles of organization as developed for a specific purpose, to a use for which they were not intended, for which they are not adapted, in a way which their originator certainly never practiced and which I feel sure he would have been the first to condemn.

New Management Views in Today's Hysteria

(*Continued from page 66*)

Our responsibility to the worker finally finds its last expression in the kind of supervision that recognizes its value to the worker and its value to the management. Such supervision is not a group of men whose task is to compel, to squeeze, to shape and to mold by techniques that are quite like mamma dealing with the child, or like the great daddy, the boss, the owner, all integrated into a chaotic, paradoxical, contradictory thing such as we now have in our supervisory techniques—not that—but here the supervisor shall recognize that his purpose is that of a directing, co-ordinating, instructor-leader. His great function is to develop those who work under his supervision, directing their efforts, not for the protection of his own official capacity, but for the productive return to the worker of the time and effort he puts into his working hours.

We shall find, as we look back upon this year 1941, that while money as an incentive has a certain important place in supervision, there are incentives deeper than that of the dollar. We shall recognize that perhaps the greatest kind of incentive that we can develop in the worker is the clinical approach by the supervisor, the industrial engineer, the industrial psychologist. This is the approach that shall seek to help the worker, to recognize his mistaken motives, to see how they will not fit in industry, and to help the worker adjust himself to the job in order that there shall be no "blue Mondays"; in order that the work shall cease to be slavery, but shall present a field for his development.

This is the approach to the understanding, insight and constructive direction of the worker's enmities and abilities. Such an approach can result in that kind of over-all incentive that can be presented by management as the best offset to the organized demands that we are now facing.

Standards for the Time Study Department

By EDWARD DELUCA

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A GREAT deal has been written about standards and their necessity in modern industry. A standard may be defined as a yardstick, a device for measuring various things, a unit of reference. In industry we have standards for equipment, labor productivity, waste control, quality control, materials, overhead costs, etc. This is so because modern industry manages by the "exception rule." Under this rule, management can immediately ascertain if a situation is getting out of hand by comparing it with predetermined standards and then can quickly take steps to remedy the situation. Since we have standards for so many things, it should be possible to have standards for time study; i.e., some method of predicting how long it should take to put a certain job or department on piecework.

To obtain the desired information I timed myself in setting rates on a job. The job selected was a bench assembly one which had already been checked from the motion study angle. It was a mica condenser testing and adjusting job which was neither too complex nor too simple. In order to assure obtaining all the information possible, the study was broken down into the following elements:

1. Approach to workers
2. Take time studies
3. Arithmetical breakdown of time study
4. Analysis of time study sheet for possible improvements in motions or methods
5. Procure blueprints, layout sheets and all other necessary piece part information from files for correct setting of rates
6. Check with planning engineer on questionable items
7. Confer with head of time standards department
8. Set up master time study sheet, enter elements, set up standard data
9. Write piece rate sheets
10. Draw process chart

(It should be stated here that all of the company's piece rates were set from time standards, and not from individual time studies.)

A simple explanation of each will be given for the purpose of clarification:

Approach to workers included getting acquainted with the foreman, sub-foremen and operators, becoming familiar with the flow of work, actually performing the operation to be certain to include all the problems confronting the operator, writing operator instruction sheets to definitely standardize the method, getting operator opinions and suggestions on the work and conferring with the supervisors.

Take time studies is self-explanatory.

Arithmetical breakdown of time study included the subtraction necessary to get elemental times (continuous readings were taken since this method is preferred by the union and by the employes to snap-back readings), eliminating abnormal values, averaging the readings to get the selected times, multiplying the selected times by the rating factor to get base times, analyzing foreign-element times to determine whether they were avoidable or unavoidable, and indexing the sheet with reference to the master time study sheet.

Analysis of time study sheet for possible improvements in motions or methods was a recheck of the workplace layout, sequence of operations, tools, jigs, fixtures, etc., to make sure that all were the best possible for the job to be done.

Procure blueprints, layout sheets and all other necessary piece part information from files for correct setting of rates meant going to the files for the necessary prints to ascertain if the work was being done as prescribed by the planning engineers.

Check with planning engineer on questionable items was for the purpose of suggesting possible improvements in the method of doing the work by a new bench layout, different material, tools, machines or fixtures.

Confer with head of time standards department was for the purpose of keeping him informed on the progress of the job and to confer as to the method of setting the rates, counting the output, using group or individual piecework, etc.

Set up master time study sheet, enter elements, set up standard data is self-explanatory.

Write piece rate sheets is self-explanatory.

Draw process chart included drawing a rough floor

plan of the department and making a flow diagram and process chart of the work.

The total time spent on this job was 102 hours which was broken down as follows:

Heading	*Time in Hours*	*% of Total*
Approach to workers	29.6	29
Take time studies	10.2	10
Arithmetical breakdown of time study	9.2	9
Analysis of time study sheet, etc.	41.1	4
Procure blueprints, layout sheets, etc.	6.1	6
Check with planning engineer	3.1	3
Confer with head of time standards department	6.1	6
Set up master time study sheet, etc.	23.4	23
Write piece rate sheets	5.1	5
Draw process chart	5.1	5

After the above data had been assembled as shown, the question was how to apply it. First, an attempt was made to correlate the time taken with the number of jobs put on piecework. In all, thirty-four piece rates were written to cover the work. This was a misleading figure, however, since many of the piece rates covered more than just one job or code. For example, the same rate might be correct for the 1-A, 1-B, 1-C, 4-A, 4-B and 4-C type condensers. If so, one piece rate was written to cover all these codes. Actually, about 150 different codes or jobs were covered, which averaged 40 minutes per piece rate for each code. While such a figure might be used as a criterion when a separate time study is taken on every job, it was found to be of little value when setting rates from time standards. Next, we endeavored to correlate the number of time studies taken with the number of piece rates set, but that was not successful. Moreover, it was too flexible since a man just had to take more time studies than actually necessary to get more time to do the job. Finally, it was decided to see if there was any correlation between the number of time study elements and the length of the time study job. The correlation found was much better than with any other factor. In all, there were twenty-three time study elements for this work which, when divided into the 102 hours spent on the job, gave a figure of almost 4.5 hours per time study element. (Bear in mind, however, that practically no work had to be done in this department with reference to planning or motion study, as that had been done prior to the advent of the time study engineer.) This figure was then checked with other completed standards with logical results. The correlation between the number of time study elements and the length of the time study job is not offered as the final or best solution to the problem of how long it should take an engineer to set rates in a given department, but it can be used as a guide until more information can be accumulated on other methods. However, it is felt that when a standard time per time study element has been arrived at for the type of work a particular company does, the time study department head will have much better control over his men.

To facilitate getting this standard time, the time study department heads might draw up a form sheet to have their men complete and return at the conclusion of each job. This form should include such items as:

1. Total hours spent on work
2. Number of time study elements needed
3. Number of rates set
4. Number of piece parts covered by rates
5. Type of work
6. Engineer's estimate as to whether time study job falls in class 1, 2, or 3, ranging from simple to difficult

The department chief can have his men break down their time into much finer divisions if he desires, although it should be remembered that the more divisions there are the more inaccurate the times may be, since the engineer may forget to record the time on many occasions and later will estimate what percentage he spent on the various divisions.

In this period of national emergency, executives must have accurate production rates to answer the pressing question: "When will it be delivered?" By having definite standards with which to rate each engineer we are providing him with an incentive to do more work. If we increase the productivity of the industrial engineer, it will expedite the setting of production rates, thereby increasing the productivity of the operators. Moreover, the form sheet, as outlined above, will disclose how many piece parts have been time studied during a certain period, the average time spent per piece part, and thereby the average cost of time study per part. Finally, standards will enable the chief engineer to rate his men as he inculcates the shop foremen to rate theirs—on the basis of production.

The Where's and How's of Better Utilization of Materials, Equipment and Labor

By PREBEN JESSEN

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Introduction

OUT of the maze of governmental regulations imposed to meet the present emergency one salient principle of war economics emerges. By now it is obvious to many persons that the United States is committed to a course that will eventually require a fairly complete and fairly rapid utilization of all available manpower, productive facilities and materials. Many of these measures have been instituted at the insistence of businessmen and industrialists who realize how imperative speed and full production are if we are to catch up on our arms deficiencies before it is too late. Although our free-trading forebears would have paled before priorities and allocations commandeering, requisitioning, licensing and the other tools of a centralized economy, the realization of the nature of the emergency has forced many, once sacred, principles to one side and many new centralized controls are yet to come.

While materials constitute the number one bottleneck in our war production effort and cause untold amounts of lost time both for machines and for labor, production machinery and equipment come second and skilled labor is third.

Whatever the magnitude of the emergency of the last World War, its relative insignificance beside today's effort is now generally accepted. We spent $30,000,000,000 to fight the last war and plan to spend $150,000,000,000 to fight the present war by the end of 1943, during which year we plan to spend $75,000,000,000.

This war has already called into production many resources that have been dormant for the past decade. It has reorganized the structure of production by turning the nation's productive potential toward heavy industry, diverting facilities from nonessentials to prime war matériel, and it will demand a stringent conservation of most materials, efficient round-the-clock use of most essential plant and transportation equipment, and by the end of this year full employment of all employable men, an average of 50 hours per week. To a consideration of the maximum utilization and conservation of productive resources—specifically, equipment, materials and labor—this article is directed. Symptomatic of the importance of the material conservation question is the creation of the Defense Bureau of Materials Conservation, whose director, Mr. L. J. Rosenwald, formerly chairman of Sears, Roebuck and Company, announced on October 14, an all-out war on waste that will "reach into factories, into attic storage rooms and into kitchens."

During the last war millions of women were trained to take over a large share of the work in the munition and other industries; and there was practically no job, skilled or unskilled, that women did not do. In England, today, women are doing such strenuous work as digging of drainage systems and laying of pipe-lines; and it is proved again and again that women do a great many jobs such as assembling, inspecting and machining intricate mechanisms in quantity better than men. As the defense effort rolls on, it becomes increasingly important to utilize all industrial equipment, materials and labor effectively and fully, and to eliminate all waste and idleness. This is the duty of the individual employe as much as it is the responsibility of the foreman and factory manager. It is good business to do all this in normal times when materials, equipment and labor are plentiful and it becomes supremely important during a period when tremendous quantities of material-for-war must be produced almost overnight, and therefore much faster than material stores and equipment can be replenished.

I. Materials

A. *Reduction of Materials Wastage*

Specific measures may be suggested for the reduction of waste and to compensate for shortages of certain materials.

A prerequisite to such measures is a careful study of *where* and *why* waste occurs because only this way will lead to methods of *how* to eliminate it. During the past

few years innumerable control and measuring instruments have been perfected which permit close, or automatic, control of machines and processes and enable the operator to reduce spoilages and overages in the use of materials. Where substitution of raw materials or parts is required, it is necessary to make modifications and adaptations of equipment to reduce avoidable waste. By close attention to the processes of re-working, repairing, reclaiming, sorting, storing, baling, and reselling of defective, obsolete and spoiled materials much waste can be avoided. Further, from the viewpoint of the economy as a whole, much material and labor can be saved by eliminating the rapid obsolescence induced by fashion and model changes. Standardization and simplification of design and unification of patterns will save materials and conserve labor.

As an example of simplification; in many plants old and "mongrel" formulas containing many ingredients should be re-analyzed to permit elimination or substitution of several superfluous and scarce ingredients thereby reducing both material, labor and processing costs of the formulas and product.

The most obvious way to determine *where* waste and spoilage occurs, and *why*, is to inspect work as it passes from operation to operation and from department to department. From carefully prepared reports on scrap and spoilage, the wasteful operations of machines or departments are detected, and it is then not difficult to find whether it is caused by failure of machines, materials, operator, supervisor or management, and then to determine *how* to bring about a reduction in the wastage.

Too much looseness of spindles, lead screws, ways and chucking devices in a machine tool will invariably cause scrap and inferior work, regardless of the care exercised by the operator.

Installation of a complete set of controls for one or more machines, pieces of equipment or processes may permit automatic start, stop and return to starting position, automatic loading or chucking and release of workpiece or load, after an operation has been performed. A complete control of cycles involving many different operations covering and combining one or more different machines, pieces of equipment or processes is now practical. Such controls include time-delaying mercury switches, solenoid valves and hydraulic cylinders which actuate cutting, grinding, drilling, tapping and other tools required for performance of desired operations. This at once minimizes human error and permits an unskilled or semiskilled operator to tend more than one machine, piece of equipment or process. However, a machine which is in good working order, if it is hand operated, can still produce waste and scrap in the hands of an incompetent operator; and this is true of any piece of production equipment and processing apparatus. A certain amount of training, inspection and supervision is therefore required.

Certain waste is practically unavoidable, such as the material remaining from stamping, shearing, cutting, grinding and innumerable other operations. However, for each avoidable cause of waste there should be developed improved methods or devices, such as those mentioned above. Usually this requires the services of a methods engineer. Much waste reduction is simply a matter of training an operator to watch for certain things and getting the inspector's check of setup and of the first or sample unit produced. Representatives of companies producing control or measurement instruments may be consulted for a solution, but this is not the best way to attack such problems, unless such company manufactures a complete line of instruments for all control purposes.

While large companies generally are efficient in the utilizing of their materials, personnel and equipment this cannot be said to be the case with most small companies. In small companies each operator frequently does a large part of the moving of materials to and from his machine and workplace. He is his own inspector and setup man and he receives very little help and instruction on the job. Too frequently he is found operating obsolete equipment which is so badly in need of repair that it cannot turn out good work consistently. An operator who has become skilled in the manipulation of an inferior machine or piece of equipment may turn out good work with little scrap, but when production must be increased and another shift added, errors, delays and waste will invariably occur.

To tool and die makers, setup men, inspectors and supervisors, rightly belong a great measure of praise when material waste of all kinds is reduced and held low. It is management's obligation to make available to a well-trained operator satisfactory tools, dies, fixtures and devices, and also complete drawings, specifications and special instructions. Small companies seeking to maximize efficiency may either have one or more methods engineers on the job, unless their foremen have been thoroughly trained in methods or they can call in outside specialists at regular intervals to inspect their methods and to make proposals for improvements. Valuable information on causes of waste should be

looked for regularly in reports on waste compiled daily by inspectors, who, unless they make analyses of wastes and defects themselves, should be kept informed of what to look for and how to find it.

B. *Conservation and Substitution of Materials*

Considerable experimentation and difficulties must be expected in adapting present equipment and personnel to handle the substitute or inferior materials which during the war period will be replacing regular materials required for armaments and other defense purposes. It is often possible to develop from new or untried materials, not only an equivalent, but a better and cheaper product. Research and experimentation in connection with materials, production equipment and methods is becoming an important function for many manufacturers and product development will receive increased impetus from the stringencies of the war effort.

There is hardly a material in use which cannot be substituted by one or more similar materials. Material inspectors and designers who have worked abroad, where the pinch of material shortages always was sharper, testify to a wide range of materials used in production of identical or similar products.

Excess usage and waste caused largely through faulty equipment, poor training and supervision and through errors and carelessness of operators, can be reduced by specific training, by establishing usage and waste standards and bonuses for workers and supervisors. In order to prevent production from falling off, such standards and bonuses should be linked and balanced with production bonuses to keep up and raise the level of production or output. In other words, effort to reduce waste should not reduce production. This paradox may be resolved by a bonus per unit of good work turned out.

A sigificant aspect of material conservation is systematic reconsideration of product design to trim off features and save on material which exceed requirements of job or customer. Since many products are still furnished in weights, quantities and qualities that are above specifications and requirements, this trimming-off process can become an important source of material, labor and profit conservation. A few examples will amplify the point:

1. In forming or building up of articles such as castings, allowances for material to be removed during fabrication to obtain a certain fit or finish may be reduced by substituting a polishing or cleaning operation for a costly removal-of-material operation. A simple grinding or filing operation may serve in place of an expensive cutting and shaping operation on a costly machine tool.

2. In processes where material originally soft hardens before being finished, the usual amount of material provided for machining can be saved by pressing or placing the material in a die of a press, a mold or fixture while in soft form and leaving it there until it hardens. This condition is utilized in injection-molded plastics, oilless bearings and from metal compound powder, powdered iron, cement-asbestos-sand products, cast and forged products, synthetic resinous products and finishes and many other products and materials.

3. Much material can be saved by standardizing, simplifying and lightening of design and construction of fittings, brackets, parts, models, patterns, base plates, frames, etc. To save wool, men's suits now come single-breasted, with small lapels and without cuffs.

II. Greater Production from Available Equipment

A. *Important Causes of Idleness and Poor Utilization of Equipment Which Good Management and Supervision Can Eliminate or Reduce*

1. Purchase, rental or construction of equipment or facilities which cannot return their cost reasonably fast.

2. Allowing a machine much needed for war work to stand idle without either attempting to bring work into the plant which the machine could profitably do, or making the machine available to other manufacturers.

3. Failure to select and train operators to tend machines and equipment properly and failure to give them necessary job and general operating and maintenance instructions.

4. Permitting the machine operator to do other work than the actual tending of his machine. The familiar example is to let operator leave machine while he transports work or tools to and from, piles and inspects work, etc.

5. Ineffective usage of equipment by not furnishing the proper help to an operator when needed, resulting in smaller production and a higher cost per piece, and valuable production hours lost.

6. Allowing the operator to slow down below normal rate because of lack of discipline, lack of supervision, lack of understanding of machine or operation, lack of daily or hourly production standards, or goals.

7. Failure to keep operator and machine supplied with enough work to do, during the day and during the year. (Poor planning.)

8. Failure to keep a piece of equipment properly oiled, protected from misuse, undue wear and tear and maintained with repair and spare parts.

9. It should be the responsibility of oilers or operators to keep equipment oiled. Supervisors and maintenance men should anticipate and prevent frequent breakdowns of equipment, power supply, etc., and thereby reduce lost time on machines to a minimum.

10. Failure to reduce sickness, accidents and undue fatigue, through failure to obtain loyal co-operation from union management and everyone in the working force, and through inability to provide satisfactory, safe and healthy working conditions, fighting spirit and discipline.

B. *Causes of Idleness and Partial Utilization of Equipment Which Are Beyond the Exclusive Control of Management*

1. Failure or inability on the part of management, labor unions and local, state and federal government to provide a satisfactory set of rules and regulations under which industry may operate and whereby stoppages and slowdowns may be held at a minimum.

2. Failure or inability on the part of management, labor unions, local, state and federal government to train enough new operators and helpers (particularly women) to permit round-the-clock operation of needed machine tools and other equipment.

3. Failure on the part of Congress and government to provide proper incentives for management and capital to promote proper subcontracting and carry through conversion of plants for defense work and increase production of war matériel.

4. Lack of ability or power on the part of the War Production Board and other government agencies to bring about maximum speed and even flow of the war production effort through the proper planning, commandeering, licensing and allocation of materials, labor, equipment, supplies, capital and management; and seeing to it that the plans are adhered to.

Shortage of materials and of trained operators is the most important single reason why machinery and equipment is not being fully utilized today. In many plants doing war work today highly needed machine tools are being operated only ten hours per day. Operators should therefore be trained without delay and ample material supply made available to operate these bottleneck machines twenty-four hours per day, and this should be the first duty of management and the WPB. It can be done, but it might be well if some arrangement could be made by the WPB whereby a certain allowance could be made from government funds to cover the wages or tuition of each trainee during a reasonable period of learning. For manufacturers, who do not ordinarily maintain a large force of machine operators, to carry the entire expense of training needed new operators may cause serious delay. It is perhaps not to be expected that operators-to-be should wish to offer themselves without pay to learn a trade or an operation for which there will be little demand after the war is over.

At present the NYA training schools turn out 85,000 young men and women for work in war industries every three months. But since the demand for new employes approximates 2,500,000 new employes every three months for the next year and a half to two years, it is clear that our training programs of all kinds must be stepped up to handle ten to fifteen times more trainees, assuming that about half of the employes may be put to work without previous training.

III. Labor Conservation and Overcoming of Labor Shortages

A. *Important Avenues to Labor Conservation*

(Also see points 3-9 inclusive in Section IIA)

1. More effective supervision and subdivision of operations and departments in public and private enterprise with increased use of financial and promotional incentives to bring out the best.

2. Use of skilled operators only on jobs requiring skill.

3. Use of hand labor only for jobs and operations for which machines or mechanical devices have not been practical.

4. Organized effort of unions, individuals, public agencies and management to speed work and extend the effective working time.

5. Prohibit compulsion by labor unions and other bodies to add operators and helpers on jobs and operations thereby increasing labor costs, lost time and idleness.

6. Encourage and direct personnel officers and all other persons who select employes for work on war production and essential peacetime endeavors to consider and push the substitution of women for work heretofore done by men, and to understand and appreciate the many advantages of which six are mentioned below, resulting to the employer and the nation by extensive employment of women.

B. *Factors Favoring the Increased Use of Women in All War and Essential Peace Industries*

1. Only by drawing upon the strength of some 14,000,000 available, and not now gainfully employed, women, as rapidly as possible, for war production work or for work which will relieve skilled men for war production work, can the United States be said to be giving maximum aid to the United Nations' cause. Such an effort would practically amount to increasing our output of war material with $20,000,000,000 per year or about 50 percent, and at the same time it would permit greater flexibility in building of an armed force of maximum striking power.

2. Experience during the present and the last war demonstrates that women are trained with relative ease and can do virtually all work now done by men. Women in England are showing extraordinary ability in driving trucks, busses, and streetcars and operating machine tools and inspection tools; e.g., micrometers, gauges, vernier calipers, and other intricate measuring instruments.

The percentage of women employes on war production work, notably the manufacture of aircraft, 50 percent and tanks, 20 percent, is steadily increasing. Women constitute as many as 90 percent of employes in some plants making fuses, gas masks, parachutes and other articles of war. These plants report that women are equal to men in attendance records, regularity, output and other factors of efficiency.

In some operations women produce up to 50 percent more than men under identical working conditions. This is due to the fact that women have superior ability for operations requiring dexterity and constant alertness and high resistance power in tedious and repetitive work. Another factor is that women employes are much less inclined than men to act in body when someone passes the word around to restrict output and slow down.

3. There are according to the latest census some 26,000,000 women over 16 years of age, who are engaged in doing "own home housework," and they constitute the most important source for additional labor, if we are to speed our war production work, and desire to minimize the uprooting of homes, communities, industry and business.

These women, it is true, do some cooking, housekeeping, rearing of children, laundering, mending, and on farms, do take an important part in manual work, but since there is only one child for every two women to care for, and since most modern homes are small and provided with all kinds of labor-saving equipment, there remain for the average women in this category many hours each day which she might well utilize on war production. One half of these 26,000,000 women might well be called upon for training and preparation for well-paid jobs in ordnance plants, and every kind of war and essential peacetime industry and service.

4. By gradually absorbing one half of the 26,000,000 women over 16 years of age doing own home housework the damaging social disruptions caused by family separations and uprooting of homes in cases where heads of families go to distant defense jobs would be much reduced. A specific and sad example of the bad effects of uprooting of homes was the murder of C. G. Browning, 40, of Mount Olive, North Carolina, by three roving children, a boy of 16 and two girls, 15 and 14, of different families, who, as reported by the New York Times on October 16, 1941, had been living in a trailer camp. The boy's father, and presumably the girls' father were engaged on war work away from home.

Interestingly enough, a recent survey by Cornell University covering 526 average couples married from two to six years, shows that girls with jobs: (1) have better prospects of marriage than those without jobs, (2) make better wives and (3) have more successful marriages. If generally valid, these findings would add a strong sociological argument to the powerful economic argument for giving women more consideration for employment, both in defense and non-defense industries.

The Field of Industrial Ophthalmology

By ALBERT C. SNELL, M.D., Rochester, New York, Chairman; ARTHUR CULLER, M.D., Dayton, Ohio and HEDWIG S. KUHN, M.D., Hammond, Indiana

A report by the Committee on Industrial Ophthalmology of the Section on Ophthalmology of the American Medical Association [1]

THE medical profession has always based the main reason for its existence on the trained service which it renders to all who make up our complex citizenship. At this time, when industrial production is important in defense, it is peculiarly fitting that individual members of our profession and its organizations take time to consider whether or not this reason for existence is being satisfactorily fulfilled in all fields. Does this service reach all classes of the population or is there need in some fields for a more realistic distribution of skilled medical services? Do the medical societies and the individual members live in a "sort of economic vacuum untouched by the pressing social and economic issues of the day," as stated in an editorial? [2]

So far as the practice of ophthalmology is related to the needs of industrial workers we find that there is a vacuum—an open gap—between the service which the competent ophthalmologist, restricted to office practice, is prepared to offer and the ophthalmic needs of the ordinary industrial worker who is not brought to this office. This vacuum is due to economic reasons or because of lack of understanding of the need of employes for this service. This gap or vacuum should be eliminated.

Because of the many complex problems that can be visualized by those interested in all phases of industrial ophthalmology and because there is an apparent need for developing a practical program of visual testing and correction to aid industry in the placement of its employes, the Council on Industrial Health of the American Medical Association suggested last year that a committee on industrial ophthalmology be appointed by the Section on Ophthalmology of the American Medical Association and that the Academy of Ophthalmology and Otolaryngology be asked to co-operate by the appointment of a joint committee. This committee has now been appointed and much preliminary work has been done. This paper is a preliminary report of this committee.

In order to present a partial picture of the need of further ophthalmic services to industrial employes attention is called to some aspects of the field of industrial ophthalmology, to the literature apposite to this theme and to an outline of a possible program of service which will meet any special need that may be revealed.

The scope of industrial ophthalmology should encompass the entire field of the visual functions of employes as these functions relate to industrial production. To illustrate the scope of this broad field, we point out that the field of industrial ophthalmology may conveniently be divided into five separate parts, although all of these are interrelated. These parts are (*a*) the efficient use of vision in industry; (*b*) eye accidents—their prevention and the treatment of injuries; (*c*) conservation of visual health (other than that relating to accidents)—its relation to general health and the relation of general health to efficient vision; (*d*) visual economics—the effect of vision on earning ability and on production, and (e) medicolegal ophthalmology—its relation to compensation for eye injuries and to protective insurance, liability and the like. In this preliminary paper we shall discuss at some length only the first of these five topics, since "the efficient use of vision in industry" is the most neglected part of the field of industrial ophthalmology. We shall merely call attention to "eye accidents" and omit all consideration of the three other topics.

The field of eye accidents includes the important program of accident prevention and the proper treatment of eye injuries. Much has been written and much effort is being constantly expended in this field. But let us point out briefly that, although during the past twenty-five years much progress has been made in the field of protecting employes' eyes from industrial eye hazards, nevertheless the average number of eye injuries

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[1] Paper presented at the Fourth Annual Congress on Industrial Health, Chicago, January 13, 1942. Reprinted by permission from *The Journal of the American Medical Association*, New York, February 21, 1942, Volume 118, pages 610-613.

[2] *Bulletin* of the Medical Society of the County of Westchester, September 15, 1941.

has not been materially reduced. This may be explained by an increasing number of machine operators and machines. Three hundred thousand compensation eye accidents yearly are still taking place. These do not include trivial accidents such as uncomplicated injuries due to superficial foreign bodies in the cornea or conjunctiva. Ninety percent of the serious accidents are preventable. There are in the United States 8,000 industrially blind and 80,000 employes blind in one eye due to industrial accidents. Special mention should be made of the importance of conferences between management and ophthalmologists in furtherance of a proper program in the use of protecting goggles, especially a type to be used over or in connection with correcting lenses. This phase of the goggle program has not been developed satisfactorily. Thus the program of the prevention of eye accidents is not working satisfactorily, and continued efforts must be directed constantly to programs of accident prevention.

In a review of the literature relating to the qualities of vision which are essential or important to industrial production, there could be found scarcely any reliable statistics which correlated all the various essential visual functions with efficiency of production in the many different and often complex jobs. In the few isolated surveys which were found, as a rule, these included data on only visual acuity; and visual acuity was usually tested without observance of recognized standards of measurement or of illumination. These surveys generally do not include any correlation between the quality of vision found and the visual requirements for specific types of jobs. There are some exceptions to these statements, among which should be mentioned the following: In England the Industrial Health Research Board and the Industrial Medical Research Council in co-operation with a committee on physiology [3] of vision (the chairman of the latter committee being Sir John J. Parsons) have made a series of surveys giving special attention to the visual needs of workers in various industries. In the United States comprehensive surveys have been made during the past two years by Professor Joseph Tiffin of Purdue University and his co-workers [4] and also by Dr. Hedwig S. Kuhn.[5] Some parts of the data of these surveys have been published, but much of the latter data has not been analyzed completely and the important facts have not all been revealed. These data are now being thoroughly analyzed and correlated.

[3] Weston, H. C. and Adams, S., Reports 40, 49 and 57, Industrial Fatigue Board, His Majesty's Stationery Office, London, 1928-1929.
[4] Tiffin, Joseph and Rogers, H. B., "The Selection and Training of Inspectors," *Personnel*, Volume 18, Number 1.
[5] Kuhn, H. S., "An Appraisal of Visual Defects in Industry," American Academy of Ophthalmology, 1940, page 208.

The part of the field of industrial ophthalmology that has been neglected most is that which relates to efficient visual performance. This is an intricate but important part. It includes an understanding of all the visual functional factors that are essential to proper visual performance in every kind of job. The study of visual efficiency includes the following topics:

1. Basic elements of visual performance; the need of standards for essential functions of vision for specific jobs.
2. Methods and technics of testing.
3. Ways and means for correcting visual defects.
4. Placement of employes according to visual qualifications.
5. Health factors that influence vision.
6. Programs of co-operation between management, employes, industrial medical departments and ophthalmologists in establishing practical methods of visual testing, correction and placement.

1. *Basic Elements of Visual Performance.*—That some amount of vision is essential to efficient production is taken for granted, but that all jobs do not require the same quality of vision or of perfection of function is not generally comprehended. For example, color vision is not essential for most jobs but is essential for some. It is nonessential for the typist, saleswoman or common laborer but is essential for the railroad engineer and the textile employe who matches colors. Identical degrees of visual acuity are not demanded for every job (fortunately, since not every employe has perfect standard acuity); also, the powers of visual perception and other functions are not employed at the same distance in all jobs. Many employes use their eyes at a working distance of 14 to 20 inches, while others are employed at unusually short or unusually long distances. Examples of those who work at unusually short distances, often at a distance of 6 to 10 inches, are the loopers in the textile industry, inspectors and employes working on fine mechanical parts; examples of those who use their eyes at unusually long distances are the crane operator and the hoisting engineer. In other occupations both near and distant vision are employed alternately. In some jobs the quick and accurate judgment of distance is a most important function; for example, pressmen and those feeding moving machines. Such jobs demand a high degree of muscle balance and of depth perception.

Only a small proportion of eyes function perfectly. Therefore, it is plain that there is need to use such perfection of various qualities of visual function as can

be found or developed, in order that all employes may find a useful place in industry. It should be noted that many specific jobs do not require the highest degree of perfection in all the essential functions of vision in order that these jobs may be efficiently performed. Moreover, since there are many common defects in vision which are correctable, it is obvious that industrial efficiency can be augmented by the institution of a program of detection and of correction of visual defects. But after the best correction there will remain many employes whose vision is still not perfect. Two percent of the male population is color blind. One of us (ACS) has estimated that 400,000 employes in the United States are amblyopic in one eye, the acuity in the poorer eye being less than 20/40. Thus it must be apparent that standards of the various essential qualities of vision must be established for a large variety of specific occupations in order that employes may be placed in jobs consistent with the degree and quality of their vision and that the job selected may be done efficiently. To establish these standards, it will be necessary to classify jobs in broad main groups with listing of jobs under each, based on a determination of the minimum visual requirements for each job classification. Such standards have not been established generally.

The essential factors of vision for which the industrial ophthalmologist must have standards for efficient production are (*a*) visual perception (visual acuity) both for distance and for near, (*b*) muscle coordination—muscle balance both for distant and for near vision, accommodation and convergence, (*c*) stereopsis and depth perception, (*d*) color vision.

To solve the problem of establishing reasonable standards for these functions of vision ophthalmologists should have a firsthand knowledge of the demands which industry makes on vision in all ordinary processes of production and also the special demands made by unusual kinds of employment. This involves a study of occupations. As a corollary to these standards of vision the ophthalmologist must be prepared also to advise proper standards of equipment which are essential for efficient visual performance. For example, he should investigate the most adequate illumination, proper ventilation and suitable chairs. For unusual types of employment, standards to indicate the best correcting lenses which are suitable both to the individual and for the specific job must be considered. The latter point suggests the problem of finding the most suitable occupational lenses for use in special occupations, a subject not generally considered. Thus the problem of establishing acceptable standards which take into consideration all factors that influence the various functions of vision and the specific visual requirements necessary to efficient production, depending on the peculiar nature of specific jobs, is complex. The problem must be solved by fixing standards which, by their employment, will make the most efficient use of all visual functions possessed by employes.

2. *Testing of Visual Functions.*—Satisfactory methods for testing vision are in common daily practice when patients are examined in the offices of ophthalmologists; but the problem of testing vision as it relates to industrial employment centers in the fact that employes, *en masse,* do not and cannot avail themselves of the opportunity of visiting ophthalmologists. Often neither the worker nor the management comprehends the need for an ocular examination, and there is at present no satisfactory and practical method of testing the vision of employes in the various plants.

To be satisfactory, the method must be a simple, uncomplicated one; it must be inexpensive in time and money both for the employer and the employe; it should be done at the plant; it must screen out those who probably have defective vision from those who are visually efficient. A satisfactory method should accomplish the testing without the necessity of complicated equipment, and it should be made by some trained nonmedical person but under the supervision of physicians, preferably by the medical department at the plant. Where this does not exist some medical man should be made responsible for carrying out a predetermined program. There is no substitute for a thorough examination of the eyes in the office when this is indicated, but since surveys show that about 20 percent of employes have defects which require examination and correction the primary step is that of uncovering those employes who do not need the complete examination. The plants that have a medical department and a competent ophthalmologist on their staff are most fortunate. However, many of the smaller plants have no such organizations, and even in the larger plants visual testing as a rule is not done satisfactorily. The technic which will embody all the desirable factors mentioned is now being developed and checked for dependability, by comparison with other accepted methods of visual testing. We believe that this phase of our problem is well on the way to a satisfactory solution.

3. *Ways and Means of Correcting Visual Defects.*—There seems to be no one way by which the final exami-

nation can be made to the satisfaction of all interested parties. Since visual efficiency means productive efficiency which is a saving in cost of production, it would seem that industry should set up an organization to carry out a complete program, from supplying the technician to doing the testing, obtaining an ophthalmologist to determine the proper correcting lenses or treatment and, finally, supplying lenses, when needed, through an optician located at the plant. Such an organization is ideal but not often possible, and other means must be employed. An ophthalmologist on part time or on a fee basis can usually be found who will co-operate with the management in making the necessary final examinations. The glasses can be furnished through a contract with an optician to be paid for either by the management or by the employe. In every industrial plant, large or small, a satisfactory method can be worked out for a complete service. Ways and means for correcting visual defects, including the fitting and supplying of suitable lenses, can be found. When requested, any reliable ophthalmologist will co-operate.

4. *Placement of Employes.*—With the qualities and degrees of visual function of each employe determined and with other data—medical, personal and psychologic—in the hands of placement personnel, the job of placement of each employe can be carried out on a fairer and more scientific basis than can the hit and miss, trial and error method of placement in common use. So far as vision alone is concerned, jobs for all employes should be found which are suitable for the visual function possessed by the employe. This concept implies an understanding of "jobs for the eyes" and "eyes for specific jobs." Placement of employes with the application of this concept is not universal. If our contemplated program can be developed and adopted, we believe that there will be not only an increase in production efficiency but also an improvement in the health, contentment and happiness of employes.

5. *Health Factors and Vision.*—The state of one's general health directly affects visual health and efficiency and, vice versa, visual health has a direct influence on general health. Space and time do not allow of further elaboration of this statement. It is made here to call attention to the intimate connection between vision and health. Also there are problems of housing, recreation, domestic relations and nutrition which have a bearing on health and which need further consideration. At the present time much investigation is being made to discover the influence that vitamins may have on general health and particularly on visual efficiency, but no satisfactory conclusion has been arrived at.

6. *The Program.*—To carry out a satisfactory program of testing, examining and correcting of visual defects, there must be complete co-ordination of activities between management, employes, medical departments, ophthalmologists and opticians. When the value of a completely co-ordinated program is comprehended, the desired co-operation between all interested parties will not be difficult to secure.

The members of the joint committee of the Section on Ophthalmology and the Academy of Ophthalmology and Otolaryngology are making a comprehensive study of all phases of the many details of the problem of the broad field of industrial ophthalmology. In the near future this committee hopes to develop a program which will close the gap between the ophthalmic needs of industrial employes and an adequate service to them.

The program visualizes (1) a further investigation of accident prevention and health factors influencing vision, (2) a study of illumination and other important equipment which are aids to efficient vision, (3) a plan of co-operation with educational institutions by which preoccupational shop training may be suited to the vision of the student or apprentice, (4) a study of rehabilitation possibilities and occupational eye wear, (5) the establishment of standards of vision based on job requirements, (6) the grouping of types of employment which can be followed efficiently with minimum standards of vision and (7) the development of a new technic of examination by nonmedical persons.

Conclusions

Medical practice in the field of industrial ophthalmology presents peculiar phases distinct from the usual practice of ophthalmology.

The social and economic status of industrial employes should be taken into consideration in planning any program of ophthalmic service.

The Committee on Industrial Ophthalmology is making progress with a program of visual testing and correction which, we hope, will be acceptable to management, to employes and to ophthalmologists.

This program aims to close the existing gap between the industrial workers who need medical care of eye defects and those qualified to render satisfactory ophthalmic service.

REVIEWS

The Dynamics of Industrial Democracy. By Clinton S. Golden and Harold J. Ruttenberg, Harper & Brothers, New York and London, 1942, pages xxvi, 358. ($3.00.)

Reviewed by HERMAN FELDMAN, *Dean, School of Business and Civic Administration, College of the City of New York.*

A stimulating, colorful and persuasive book is offered for the enlightenment of management by two officials of the Steel Workers Organizing Committee (CIO) who have made a national reputation for their ability to present labor's side in the battle of production. Most of this volume contains the case records of the problems and processes of collective bargaining and union-management co-operation, as observed or experienced by labor leaders who have been in the thick of the fray. They say frankly, "This book makes no pretense of being impartial," but the discussion is meaty, objective and on a high level.

A final section presents the aspirations of organized labor with regard to the place of labor in individual industries and in the economic system as a whole, and thus raises major questions of policy for both the war and postwar era. Both in these larger matters and in the suggestions with regard to the proper administration of labor contracts and the handling of practical factors of plant operation, this is one of the most instructive and challenging books available on the subject within the past decade.

Distribution Cost Analysis. By Donald R. Longman, Harper & Brothers, New York, 1941, pages xix, 289. ($4.00.)

Reviewed by PAUL H. NYSTROM, *Professor of Marketing, School of Business, Columbia University.*

Cost analysis as an aid to management has come a long way during the past 40 years. Difficulties of one kind or another, such as the labor and expense involved in making detailed analyses, have prevented the widespread applications of cost accounting such as hoped for by its early proponents. Experiments and inventions, particularly in the introduction of variants in the theory, in short-cuts and in the use of mechanical accounting equipment, have, however, continued and made progress in practical cost analysis possible.

Dr. Longman's book constitutes an important signpost on the road to wider use of cost analyses in marketing. There is much information about this subject boiled down into the 250 pages of this book. It presents a wealth of detail on the various conditions that influence costs of operation. It represents wide reading and careful study. It may probably be described as one of the best works written about its subject to date. It presents the arguments for cost analyses in great detail and directs attention to the lines along which such analyses may be made. The practical minded will find in it a number of ingenious suggestions for arriving at the effects in terms of costs of changes in the various overhead factors in modern business.

One of the defects of the book, in this reviewer's opinion, is the lack of high-lighting of the principles and main points urged. A summary of these main points, indicating conclusions and possible applications, would have been a real help to the busy reader trying to find out what the book's main contributions are. The theoretical nature of its presentations are at once its weakness, as well as its strength.

There can be no disagreement as to the need for cost analyses in the fields of distribution. The next step is to see how such analyses may be made within practical limits of expense and energy. Dr. Longman may be planning another book in which he will show how the theories of this work may be practically applied. It is sincerely to be hoped that he will complete his study begun in this work by such an additional volume.

New Strength for New Leadership. By Erwin Haskell Schell, Harper & Brothers, New York and London, 1942, pages xiv, 137. ($2.00.)

Reviewed by FRED W. SHIBLEY, *Bankers Trust Company, New York.*

This quaintly human, sensitive, yet practical philosophical treatise is of the nature of a fireside chat of an experienced and conscientious instructor of superior young men about to receive their degrees as Masters of Science, a group whose mental reactions he understands thoroughly. A spiritual note flows rhythmically through the discussion, lifting it to a high ethical plane.

Professor Schell is a natural teacher. He possesses a convincing personality. He is never dictatorial, but develops thought in his students by presenting to them ideas which he appears to possess in an inexhaustible supply.

He outlines clearly and specifically in the chapter "Interplay," the mental approach of youth to the attitude of the older generations. He understands, through possessing a keen sympathy, how and what young men think as they contemplate the activities of life.

A shrewd intelligence is displayed in his discussion of human qualifications requisite to become a "Man of Parts," as he designates the successful man who is co-ordinative and co-operative in the conduct of his affairs, a good father, a progressive citizen, a fair competitor, a reliable friend and essentially a patriot.

Professor Schell reveals himself and the secret of his success as a teacher in the exceptional chapter on Nature, which is remarkable for its clarity of thought and simplicity of expression. He appears fully to appreciate the fact that he who studies in the library of nature is in a fair way to arrive at a rational conception of the two fundamental impulses of the universe, the primordial impulse of energy and its marvelous evolutionary product, life.

Such an ethical discussion of conscious behavior, together with the social and intellectual requirements for a happy and successful life by so eminent an instructor of youth should prove of great educational value, not alone to young men possessing trained minds together with the ardent desire and determination to attain honor and distinction, but interesting as well to men of an older generation who have traveled the difficult road to success in their several chosen avocations. For this book possesses a nostalgic flavor certain to arouse memories, wonderments and longings of former days, particularly of that period when they were about to cross the threshold of manhood and assume its responsibilities.

Shop Management for the Shop Supervisor. By Ralph Currier Davis, Harper & Brothers, New York, 1941, pages xii, 333. ($2.50.)

Reviewed by G. P. HUTCHINS, *Vice President, Elliott Service Company, Inc., New York.*

The present volume is substantially a simplification of Professor Davis' *Industrial Organization and Management,* 636 pages, originally published in 1928 and revised in 1940. The volume deals in outline detail with the basic principles of management and industrial organization, with various phases of production control and quality control, with motion and time study, plant maintenance, materials control, stores and salvage, and a concluding chapter on "Labor Management and the Shop Supervisor."

Some question might be raised as to the typical "supervisor" to whom this text is addressed. Many organizations apply the term of supervisor only to important line executives of far greater-than-average foremanship education and training, and they, this reviewer believes, would gain help from it. I do not believe, however, the average foreman would benefit by this volume without much interpretation, because few foremen have a voice in determining many of the matters here covered or function beyond operating under the standard practices set for the conditions of their particular industries or their particular subdivisions by their executives.

The average foreman, is, however, far too little acquainted with the organization structure of his company and the functions of various departments, and should have more information.

If I were a production executive I should be glad to have this book as a helpful outline with which to enlist the co-operation of the heads of the various departments, such as accounting, purchasing, time study, job analysis, matériel, cost-keeping, research, personnel, etc., to hold a series of question-and-answer meetings with foremen, out of which could be developed a series of mimeographed bulletins which would provide each foreman with a standard manual of approved practice for all the divisions of the company, such as has been done in a number of cases with notable success.

Of course, these are personal opinions, but they emphasize my conviction that this is a book for department heads and training men rather than for average foremen, to whom it would, I believe, need much interpretation and further simplification in relation to the standard practice of their individual companies.

There is much of value in the concluding chapter on "Labor Management and the Shop Supervisor," but here again there is need for considerable further separation and simplification thoroughly to impress the many points upon the average foreman so clearly and definitely a few at a time that they will be a permanent guide to wise man-management methods.

How to Train Shop Workers. By C. A. Prosser and Philip S. Van Wyck, American Technical Society, Chicago, 1941, pages 126.

Reviewed by WILLIAM H. BEDELL, *Assistant Personnel Manager, Monroe Calculating Machine Company, Orange, N. J.*

Graphic presentation is one of the high lights of *How to Train Shop Workers.* A total of thirty-two charts presents the picture of the necessary steps in instruction of new and different types of work for the foremen, supervisors or key men.

The manual is timely in light of the current emergency expansion program in industry and the equally important training problem. The burden of this training program will, of necessity, be placed upon foremen, supervisors and key men in our manufacturing establishments.

The graphic presentation and condensed description of the charts increase substantially the value of the manual. Its greatest use would be in combination with foreman training or supervisory conferences to supplement the company's own training program.

Part One of the manual describes the foreman's duties and responsibilities, discussing briefly the job, and the foreman as a manager, supervisor and trainer of workers.

Part Two: "Planning what training to give the worker," analyzing habit training and preparing the outline of the necessary training to be given.

Part Three: "Finding what to teach by job analysis," analyzing the job, finding what to teach as to safety, skill in performance steps, order of performance steps, tools, machines, and materials, etc.

Part Four: "Methods procedure and devices in putting over what is to be taught," gives the supervisors the fundamental techniques of selling the job to the prospective trainee.

Part Five: "Training the worker right," emphasis starting the worker off right and following up the training.

Part Six: "The foreman as a 'human engineer,'" deals with the responsibilities of the foreman as a leader. This part, due to the difficulty of trying to cover in a general way the foreman's job in a large number of different industries, deals with generalities and is less specific than the preceding parts which are very much to the point.

The manual is written in good shop language, easily understood; from reading it, one readily gets the impression that the authors appreciated the task of effective training and have had considerable experience with it.